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REPORT

OF THE

SECRETARY OF COMMERCE AND LABOR

CONCERNING

PATENTS GRANTED TO OFFICERS AND EMPLOYEES OF THE GOVERNMENT

UNDER THE PROVISIONS OF PUBLIC RESOLUTION
NO. 15, APPROVED BY THE PRESIDENT
FEBRUARY 18, 1907

MAY 5, 1908.—Referred to the Committee on Patents
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DEPARTMENT OF COMMERCE AND LABOR,
OFFICE OF THE SECRETARY,
Washington, May 5, 1908.

SIR: I have the honor to transmit herewith a report of the investigation of patents granted to officers and employees of the Government upon articles used by the Government, the said investigation having been made in accordance with Public Resolution No. 15, approved February 18, 1907.

Very respectfully. OSCAR S. STRAUS,
Secretary.

THE SPEAKER OF THE HOUSE OF REPRESENTATIVES.

U.S. doc. 22

REPORT OF THE INVESTIGATION CONCERNING PATENTS GRANTED TO OFFICERS AND EMPLOYEES OF THE GOVERNMENT.

The resolution is as follows:

(PUBLIC RESOLUTION—No. 15.)

JOINT RESOLUTION Directing the Secretary of Commerce and Labor to investigate and report to Congress concerning existing patents granted to officers and employees of the Government in certain cases.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of Commerce and Labor be, and he is hereby, directed to investigate and report to the Congress what existing patents have been granted to officers or employees of the Government of the United States upon inventions, discoveries, or processes of manufacture or production upon articles used by the Government of the United States, and how and to what extent such patents enhance the cost or otherwise interfere with the use by the Government of articles or processes so patented, and shall also report what royalties, if any, have been paid to officers or employees of the Government on any articles or processes patented.

Approved, February 18, 1907.

SCOPE OF THE RESOLUTION.

The resolution is clearly divisible into two separate requests for information; the part down to the middle of the third line from the last, constituting the first division, relates to existing patents—that is, patents which have not been granted for a longer period than seventeen years, or, in very rare instances, those granted more than seventeen years ago, but which have been extended; the cases under this part of the resolution are limited to patents granted to officers or employees of the Government of the United States. When cases are disclosed which come within the terms of this part of the resolution, the information required concerning them pertains to the cost to the Government for the use of such patented articles or processes, or the interference with their use by the Government, by reason of their being patented.

The remaining part of the resolution, reading "and shall also report what royalties, if any, have been paid to officers or employees of the Government on any articles or processes patented," is in the nature of an amendment, and the cases coming within its terms are neither confined to those of existing patents nor to those in which patents have been granted to officers or employees of the Government. The word "royalty" has a technical meaning in connection with the subject of patents, and does not cover profits when they are not in the form of royalty. The Bureau, however, has not confined its inquiry to cases of royalty, but has sought to cover any consideration accruing to employees in cases covered by the resolution, no matter what the particular method of securing it may have been.

Both parts of the resolution, however, are confined to cases wherein patented articles or processes are used by the Government, thus making it apparent that Congress did not intend the inquiry to extend to the cases of employees interested in patented articles or processes used in the commercial world, but not used by the Government.

Scope of the investigation.—The work of the Bureau under the resolution disclosed the fact that if the inquiry were confined to the scope of the resolution it would prove to be a one-sided treatment of the subject and tend to mislead the Congress in considering legislation for the regulation of the ownership of patents by Government employees. It was considered desirable, therefore, to cover, in a measure, the other side of the general subject and show cases wherein the Government has been caused no expense or interference by the use of articles or processes patented by its employees, but, on the contrary, has derived a saving in labor and material from the use of such patented articles or processes. Cases are also included wherein the Government has been able to render the public a service which would have been absolutely impossible without the use of discoveries and inventions of its employees, irrespective of any consideration of cost. These facts will materially aid the Congress in understanding all sides of the subject-matter of the resolution.

Services investigated.—The wording "officers or employees of the Government of the United States" is very general and comprehensive. It would, no doubt, include every individual in receipt of remuneration for service rendered the Government, amounting to several hundred thousand persons. It was therefore necessary to place some limitations upon the classes of employees to be investigated, especially since preliminary steps taken to disclose the best methods for obtaining the data showed that an individual inquiry of each officer or employee would be necessary. It seemed reasonable that practically every case coming within the terms of the resolution would be disclosed if the investigation covered everyone in the Federal service in Washington, D. C., and, in addition, the officers of the Army, Navy, and Marine Corps, and the observers of the Weather Bureau. The Departments and services in Washington, D. C., covered are as follows:

Department of State.
Department of the Treasury (including the Bureau of Engraving and Printing).
Department of War.
Department of Justice.
Post-Office Department (including the mail-bag repair shop).
Department of the Navy (including the Naval Gun Factory).
Department of the Interior.
Department of Agriculture.
Department of Commerce and Labor.
Smithsonian Institution.
Interstate Commerce Commission.
Civil Service Commission.
Government Printing Office.

The services covered throughout the country at large are the officers of the Army and the Navy and the observers of the Weather Bureau.

Each individual was required to state over his signature any interest he may have in patented articles or processes and his knowledge

concerning the use by the Government of any articles or processes covered by a patent owned by an employee. From this individual inquiry specific cases were disclosed, each of which forms the basis of a separate investigation.

Legal status of the ownership of patents by Government employees.—An important development of the investigation has been the discovery of the many and varied opinions held throughout the Government service with regard to the status, as a matter of law, of the ownership of patents by Government employees, and also with regard to the ethical considerations involved. From numerous verbal statements made to the agents of the Bureau, and from communications in its files, there can be no doubt of the unfortunate effects which this equivocal state of the matter has had in the way of discouraging inventive genius in the Government service. That the Government has suffered in this respect would appear to be the case if the experience in private business, where every stimulus is given to improvement in methods and machinery, can be taken as a comparison.

There is no general statute on the subject at the present time and the law in regard to the ownership of patents by Government employees is exactly the same as it is for the employees of private individuals or corporations. The only exception is in the case of employees of the Patent Office, who, under section 480 of the Revised Statutes, are unable, during the period of their employment, to acquire, directly or indirectly, except by inheritance or bequest, any right or interest in any patent issued by the Patent Office. There are certain doctrines of law laid down in court decisions upon the subject of shop right, implied license, etc., but these have received no uniform development with regard to the Government employee. On account of the unsettled state in which the matter rests it has become the custom for the Government employee to dispose of his patent by sale to private parties, frequently at a nominal sum, or to voluntarily relinquish his rights to the Government, when at law he certainly could not be compelled to do so. In the former case, where patents are sold to private parties, the Government is compelled to meet the demands made upon it by the owner of the patent, whatever they may be, and in either case the employee-inventor is at a decided disadvantage from a financial point of view. As an illustration of this, the Bureau was informed by an inventor of fifty or more useful devices in the naval service that when he devoted his time and study to the development of inventions of use in the commercial world he met with decided financial success, but that his efforts and expense to develop devices of value to the Government has netted him a financial loss.

On March 3, 1883, the Congress enacted into law a provision that if an employee of the Government would dedicate the free use of his invention to the Government and the people of the United States, a patent would be issued to him without the payment of fees. (22 Stat., p. 625.) As this provision cuts off all hope of remuneration from the patent, both from its use by the Government and the public, inventors in the Government service have not generally resorted to it. This law is, in form, merely permissive, but the Secretary of Agriculture has attempted to make it compulsory in his Department by his general order of May 8, 1905, in which he requires employees making

useful discoveries or inventions connected with the work of the Department, through the expenditure of Government time and Government money, to cause the patent to be applied for through the law officer of the Department under the terms of this act. This policy is in line with the decisions of the courts upon the doctrine that when an employee takes out a patent, the subject-matter of which is in the general line of his employment, there is an implied license in the employer to use the patent. There is a marked distinction, however, between this doctrine and the practice in the Department of Agriculture, in that the ownership of the patent right in the former case remains in the inventor, who can regulate its use as he may see fit, subject to the employer's license, while the method required in the Department of Agriculture takes the entire property right from the patentee, leaving him nothing of monetary value.

In connection with an appropriation of $100,000 in 1901 for constructing and testing implements of war, etc., by the Board of Ordnance and Fortification (31 Stat., 875), it was provided as follows:

Provided, That before any money shall be expended in the construction or test of any gun, gun carriage, ammunition, or implements under the supervision of the said board, the board shall be satisfied, after due inquiry, that the Government of the United States has a lawful right to use the inventions involved in the construction of such gun, gun carriage, ammunition, or implements, or that the construction or test is made at the request of a person either having such lawful right or authorized to convey the same to the Government.

It was enacted February 18, 1893 (27 Stat., 458), that no person should serve on the Board of Ordnance and Fortification "who has been, or is, in any manner interested in any invention, device, or patent which, or anything similar to which, has been considered or may be considered by or come before said Board for test or adoption."

There was annexed to the appropriation for manufacture of arms at national armories in the appropriation act of March 3, 1875, a proviso that "hereafter no money shall be expended at said armories in the perfection of patentable inventions in the manufacture of arms by officers of the Army otherwise compensated for their services to the United States." (18 Stat., 455.)

Section 1673, Revised Statutes, prohibiting the payment of royalty to officers for patents relating to the "Springfield breech-loading system" was superseded by the act of September 22, 1888 (25 Stat., 489), providing for the Board of Ordnance and Fortification.

The foregoing provisions of statute law comprise all those touching upon the general subject of the resolution, and are indicative of the desultory treatment which the matter heretofore has received. The fragmentary attention it has thus had has served no purpose in defining any well-settled policy; but, on the contrary, has been sufficient to add further doubt and speculation as to just what attitude the Government should assume in the many and varied circumstances under which the question has presented itself.

New legislation.—The advisability of regulating the subject of the resolution by a provision of law applicable in all cases has been apparent to officers of the Government for many years, and has been the subject of repeated recommendations on the part of the Secretary of War and the Secretary of the Navy. Such recommendations will be found in the annual report of the Secretary of the Navy for 1901, page 117; annual report of the Secretary of the Navy for 1904, page

24; annual report of the Chief of the Bureau of Ordnance for 1907, page 22.

January 3, 1900, there was introduced in the Senate a bill, which subsequently passed the Senate, dealing with this subject. In referring to this bill the Secretary of the Navy said:

> This matter has been repeatedly recommended by the Department in its annual reports to Congress, upon one occasion receiving the favorable consideration of the Senate. The necessity for the enactment of some provision of law controlling this subject is emphasized each year, as in the course of naval development a wider range of inventions is utilized in the equipment of ships of war. I have the honor to recommend its favorable consideration by the committee.

This bill permitted the Navy to use the patents issued to any officer thereof, who should receive such compensation which the Court of Claims might award after considering all the circumstances connected with the making of the invention, and especially all the facilities in originating, working out, or perfecting the invention which the officer may have enjoyed by reason of his official position. This method of dealing with the subject is contradistinguished from the other procedure of having the value of letters patent which the Government desires to use ascertained by appraisers and the absolute ownership of the letters patent transferred to the Government in consideration of the payment of its appraised value.

The contact of the Bureau with the inventors in the Government service has shown that there is considerable doubt among them as to the propriety of the Government investigating their property rights in letters patent. While, as a rule, the information requested has been furnished in all branches of the service, the Bureau has learned both verbally and by written protest that the right of the Government to investigate the personal affairs of its employees is challenged. This fact but adds further weight to the argument in favor of definite legislation. The position taken is well disclosed by the following extract from a letter in the files of the Bureau:

> In reply to your letter of December 13 I have the honor to inform you that my letters patent covering improvements in hoisting apparatus were assigned by me in accordance with the law to another citizen of the United States; that the arrangement between us was a purely personal and private business transaction, into which the Government has no more legal or moral right to inquire than into any other of my personal and private affairs; and that I regret that, although I have no objection to publishing the whole matter, I am constrained by my convictions to respectfully decline to furnish the information requested.

The general results of the investigation by the Bureau of Corporations under this resolution point to the desirability of suitable legislation, which will clear up the highly confused status in which it has always rested, and in taking such action there can be no question as to the wisdom of so treating the employee inventor that he will not be placed in a more unfavorable position with regard to his inventions than is the case in private life; in fact, it would seem to be to the best interests of the Government, from a purely selfish point of view, to place the employee inventor in a very favorable position with respect to valuable inventions and discoveries which he may conceive.

The number of cases.—The preliminary inquiry by schedule developed 253 cases coming within the provision of the resolution.

The total number of cases reported is apportioned among the Departments and Services as follows:

Department of State	None.
Department of the Treasury (including Bureau of Engraving and Printing)	12
Department of War	82
Department of Justice	None.
Post-Office Department	2
Department of the Navy (including Naval Gun Factory)	115
Department of the Interior	8
Department of Agriculture (including Weather Observers)	16
Department of Commerce and Labor	7
Smithsonian Institution	1
Interstate Commerce Commission	None.
Civil Service Commission	None.
Government Printing Office	10

Of this number, approximately 141 have brought no net return to the inventor. Approximately 78 have brought returns to the inventor, though in a number of cases these returns were not from the Government direct, but were the proceeds of sales of the patent to outside parties. As to the remaining cases, it was impossible to determine definitely whether any remuneration had been received by the inventor.

TREASURY DEPARTMENT.

Press register.—Joseph L. Harley, an employee of the Bureau of Engraving and Printing, received a patent upon a press register, being a device which registers every impression taken with the press. It is now in use on over 500 presses in the Bureau, and it is the main reliance in the way of a safety check upon the unauthorized use of the presses engaged in printing money, stamps, etc. This invention has been in use for many years and nothing has ever been invented to take its place or to do its work with anything like the satisfaction or security which it gives. Mr. Harley stated, in an interview on October 14, 1907, that he never received any royalty or compensation for the use of his invention; that he made the invention absolutely during his own time and with the employment of his own material, and that the Government has not even remunerated him for the outlay which he made in the perfection of the invention. The great value of Mr. Harley's register to the Government is testified to by all those familiar with its use.

Mr. Harley is also the inventor of several other devices which are in use in the Bureau, among them a postage-stamp press, 26 of which are in use. He has assigned to the Government the right to use all of his inventions except the press register.

Form base.—Charles E. Beach, of the Bureau of Engraving and Printing, received patent No. 747845 upon a form base used in the Bureau, being a device for the rapid adjustment of the form without the use of printer's furniture. The inventor stated in an interview that he has granted to the Government a shop right on the three bases now in use in the Bureau; that previous to this invention separate bases were required for each size of printing plates used, each block costing from $40 to $60, and that as the Beach block will accommodate by adjustment a large number of different sizes of plates, the great saving of the invention is evident.

Mr. Beach is the inventor of a number of other devices used in the Bureau which both facilitate the work and result in saving to the Government, and he stated that he had received no profit whatever from the use of any of his inventions by the Government.

Numbering machine.—James D. Smith, an employee of the Bureau of Engraving and Printing, is the inventor of rotary numbering machines used in numbering the paper money. All of this work is done upon his machines, and he stated on October 14, 1907, that he had given the use of his machines to the Government and had received no profit whatever. His patents have now expired.

Rail screw.—William H. Pritchett, an employee of the Bureau of Engraving and Printing, is the patentee of a rail screw, being a device for holding together the parts of the wooden rim of the wheel on transfer presses in use in the engraving division of the Bureau. Mr. Pritchett stated on October 14, 1907, that he had received no profit whatever from the use of his invention by the Government; that it had been used in the construction of these presses by the manufacturer without his knowledge or consent. The patent has now expired.

Duplicating process.—C. R. McBlair, an employee in the Supervising Architect's office, is the patentee of a photographic process used in the duplicating gallery of the office of the Supervising Architect—patents Nos. 403061 and 442450. There accompanies Mr. McBlair's signature an affidavit that his formulas have saved the Government from $5,000 to $8,000 per year, and that he has never received any compensation whatever for their use. The Supervising Architect makes a signed statement to the same effect.

Process for making concrete piles.—W. C. Lyon, of the Supervising Architect's office, is the patentee of a process and apparatus for making concrete piles for foundation work. Mr. Lyon stated, on October 15, 1907, that he had sold out his entire interest in the patent to the Simplex Concrete Pile Company; that the patented process has been used by contractors on public buildings, but that he had no connection whatever with this indirect use of his patent by the Government.

Smoke consumers.—George H. Burpee, of the Supervising Architect's office, is the patentee of a smoke consumer, which was used in the Charleston Navy-Yard. Mr. Burpee stated, on October 15, 1907, that he had received no profit whatever from the use of his invention by the Government; that he sold out his rights in the patent to a company, and had no definite knowledge about the patent after the sale.

Seal for coin sacks.—Thomas I. Porter, of the Secret Service division, Chicago, Ill., is the inventor of a seal for coin sacks, which has been adopted for use in shipping coin by the Treasury Department generally. It is a device for preventing the opening of the sack after it is once sealed, and is the most effective invention of its kind on the market. The article is also in extensive use commercially by banks and express companies, and was adopted by the Government subsequent to its use commercially. John E. Wilkie, Chief of the Secret Service, stated, on October 15, 1907, that Mr. Porter had assigned his interest in the patent to the Porter Seal Company, of Illinois, and that Porter's profit received from the invention consisted of dividends on stock paid by the company.

Sealing machine.—Josiah Dupau, an employee of the Treasury Department, is the inventor of an envelope-sealing machine, which is used to some extent by the Government. Mr. Dupau stated on

October 16, 1907, that the first machines built under the patent were constructed by himself at his home; he sold five to different offices of the Government, mostly pension agencies, at $60 apiece. He then disposed of his patent to a partner whom he had taken in with him, and this partner subsequently sold the machine to a stock company, in which W. F. Warner, of the Treasury, held a large interest. Mr. Warner stated on October 16, 1907, that the company manufactured the machine for a time in Philadelphia, and disposed of quite a number of them to commercial houses, and nine to the Government, not including the five already mentioned, which were sold by Mr. Dupau. Mr. Warner stated that the price of the machine was $60, but the price paid by the Government ranged from $30 to $60. The company has never paid any dividends, and Mr. Warner considers the money he invested in the enterprise a total loss.

See the statement of Joseph T. Wilkinson, an employee of the Government Printing Office, as to his connection with this machine, page 72.

Loose-leaf binder.—George T. Dalton, sr., of the office of the Auditor for the Post-Office Department, Treasury Department, is the inventor of a loose-leaf binder, which is in use in the office of the Auditor. It is supplied through a manufacturer at $1.18 apiece, and 45 of them are in use.

Revolving door.—Frank A. Lang, assistant superintendent of public buildings, New York City, received patents Nos. 841696 and 867888, both relating to revolving doors which have been used by the Government. March 2, 1907, the Treasury Department accepted the proposal of Mr. John H. Carl, the lowest received in competition, for the installation of a door under the Lang patents, and this door was placed at the southerly entrance of the United States court-house and post-office building, New York City. Prior to this, however, the inventor had given a written waiver of all claim of royalty or other compensation on account of this door, dated February 26, 1907. October 8, 1907, the inventor assigned his rights to the Convertible Rotating Door Company, of New York City, with the stipulation that he should receive a royalty on all doors manufactured by the said firm for parties other than the United States. In addition to the doors above described the inventor states that work is now under way on two doors to be installed at the subtreasury and post-office, Boston, Mass.

Reversible folding sash window.—A. F. Johnson, architectural draftsman, custom-house, New York City, received patent No. 845418 upon a reversible folding sash window, which has been used for thirty-two windows installed in the building at the United States immigrant station, Ellis Island, New York. The inventor states that his patented window was selected to facilitate cleaning where bars are placed outside of the opening; that he had no financial interest in the matter, and waives all claim for royalty.

WAR DEPARTMENT.

ORDNANCE.

Wire-wound gun.—William Crozier, brigadier-general, U. S. Army, was granted patent No. 671879, upon a wire gun, which is used for experimental purposes. Free license has been granted to the United States for its use and two guns have been constructed

which embody the features covered by the patent. The inventor states that all wire-wound guns covered by this patent have thus far been manufactured by the Government only. The records of the Patent Office show that this patent was dedicated to the public January 20, 1903.

Brown segmental wire gun.—G. N. Whistler, colonel, U. S. Army, states that while he was employed by the company developing the Brown segmental wire gun, and on leave of absence, several patents were taken out for improvements, either in the construction of the gun or for apparatus in connection with the construction thereof; that he does not remember whether any of the patents were taken out jointly in the name of Mr. Brown and himself, but that he took the inventor's oath whenever it was necessary; that the only compensation received by him was his salary from the company. The Chief of Ordnance states that the War Department has purchased from the trustee of the Brown segmental wire tube gun one 6-inch and one 10-inch gun; that the Department entered into a contract with him May 18, 1898, for twenty-five 5-inch and twenty-five 6-inch segmental wire guns, but no guns were delivered under this contract and it has since been annulled; that a 5-inch gun was submitted without expense to the United States and tested by the Department in 1894; that all of the guns enumerated above were manufactured for the trustees of the Brown segmental wire tube gun by private manufacturers.

Spring return motor carriage.—W. B. Gordon, lieutenant-colonel, U. S. Army, has patented in the United States and foreign countries what is known as the "United States 12-inch motor carriage, model of 1896," which is used by the Government. This carriage has been manufactured since its adoption to the exclusion of a foreign design, which was the previous United States standard 12-inch carriage. The records of the office of the Chief of Ordnance show that 85 carriages have been manufactured under this patent and are in use. Of this number 6 were manufactured by the Government at the Watertown Arsenal, Watertown, Mass., and the remaining 79 were manufactured under private contract. The patentee states that he has conceded to the United States the right to manufacture or to obtain by contract, without royalty, at the option of the Chief of Ordnance, such carriages as may be desired. The Chief of Ordnance states that no royalty or other profit has ever accrued to the inventor from the use of his patent and it has not interfered with the use by the Government of carriages so patented. The cost of each carriage is from $5,200 to $5,500.

Split-ring gas check.—Gregory Gerdom, ordnance machinist, Sandy Hook proving ground, until February 26, 1906, when he resigned, received patent No. 539733 upon a split-ring gas check, for which he received $50,000 by act of Congress approved May 25, 1900. This sum was paid by the Chief of Ordnance October 24, 1900. The report of the Secretary of War, 1900, volume 3, page 417, gives an explanation of the connection of Charles B. Wheeler, captain, United States Army, with this patent.

Breech-loading ordnance.—Gregory Gerdom, ordnance machinist at Sandy Hook proving ground until February 26, 1906, when he

resigned, received patents Nos. 451242, 466848, 515707, 585517 upon breech-loading ordnance, No. 582469 upon gas-vented breech machanism, and No. 731403 upon firing attachment for ordnance. Under an existing contract with the owners of these patents, Gregory Gerdom and J. H. Reynolds, the United States agrees to pay $30 for each gun in which is used all or any of these patents. About 335 guns have been or are being manufactured under this arrangement, making a total of $10,050 paid for the use of the patents.

Breech mechanism for cannon.—John W. Stockett, draftsman, Ordnance Office, received patents Nos. 601176 and 601177 upon breech mechanism, and 154 guns embodying features covered by these patents are in use in the Army. He has also received patent No. 620259 upon breech mechanism, and 200 guns embodying features covered by this patent are in use in the Army. Mr. Stockett has also received patent No. 699256 upon breech mechanism, and 770 guns embodying features covered by this patent are in use in the Army. Mr. Stockett states that he has given no license to the Government for the use of any of the above inventions; that some of the guns having his inventions are manufactured by the Government, upon which he has received no royalty or other profit, while others are manufactured by private manufacturers for the Government.

Method of casting guns and cooling them from the inside.—Thomas B. Rodman, brigadier-general, U. S. Army, received a patent upon a method of manufacturing cast-iron cannon, which has been used by the Government. The records of the Bureau of Ordnance do not show that any payments were ever made to the inventor as a royalty on his patent; that a large number of cannon made in accordance with General Rodman's process were purchased from private manufacturers during and subsequent to the civil war, but there are no means of determining what amounts were paid by them to General Rodman or to any parties sharing the proprietorship of his patent. Official tests disclosed the fact that cannon made by the Rodman process—namely, cast on a core and cooled from the inside—were much superior in endurance and safety to those cast solid, and the specifications of the Government were made to call for this process.

Gun mounting.—William Crozier, brigadier-general, U. S. Army, and A. R. Buffington, brigadier-general, U. S. Army, retired, jointly received patent No. 555426 upon a gun mounting which is in use in the Army. The report of the Chief of Ordnance for 1896 states that an allotment of $45,000 was made for the construction of a disappearing carriage for the 12-inch breech-loading rifle, after the Buffington-Crozier design. The records of the Chief of Ordnance show that 395 gun carriages, embodying features covered by this patent, have been constructed, some by the Government and others by private manufacturers for the Government. The letters patent state that "We hereby dedicate to the Government of the United States the free right to use, to make, and to have made in the United States for its own use gun mountings embodying this invention."

Magazine firearms.—A. H. Russell, colonel, U. S. Army, received patent No. 230823 for magazine firearms. The records of the Patent Office show that on February 4, 1881, the patentee transferred to

William R. Livermore, Engineer Corps, U. S. Army, an individual one-half of his interest in this patent, including extensions; that on November 21, 1883, Livermore assigned to Russell a one-third of his half interest in this invention; that on October 7, 1898, Livermore assigned to Russell all his right, title, and interest in said invention and letters patent, with all rights of action and claims for infringement of same accrued prior to August 3, 1897; consideration, $1,965.44. In connection with this patent Colonel Livermore states that the claims of himself and Colonel Russell are fully stated in the amended petition filed February 7, 1899, in the Court of Claims, case No. 20833; that during the life of the patent upward of 75,000 United States magazine rifles, caliber .30, embodying this invention were manufactured by the Government; that no compensation for such use has been received, but it is claimed that the inventors are entitled to receive upward of $1 for each and every one of these rifles. Colonel Russell claims that devices embodying this patent and No. 278980, for cartridge packing case, form the basis of the modern clip magazine embodied in the new United States Springfield rifles, adopted after expiration of patents, but he makes no claim for compensation. He claims that devices from patent No. 230823 were used in the construction of the Krag-Jörgensen magazine guns. Senate bill No. 682, Fifty-ninth Congress, which passed the Senate, provided for allowing him to go before the Court of Claims for consideration. No compensation has been received.

Magazine gun.—A. H. Russell, colonel, U. S. Army, received patents Nos. 295285, 295286, and 396835 upon improvements to magazine guns. Col. W. R. Livermore, U. S. Army, who has been interested with Colonel Russell in patents, states that he believes that the cut-off covered by these patents has been used on all the new Springfield magazine rifles. He states that Colonel Russell and he presented a gun before the United States Government board in 1882, on the calling of the Government upon inventors, which gun embodied devices covered by these patents, so that these devices, though not adopted by the Government until after the patent covering them had expired, had been fully presented to the consideration of the military authorities. No compensation has been requested.

Loading tray for breech-loading ordnance.—A. H. Russell, colonel, U. S. Army, was granted patent No. 236426 upon a loading tray in use in army guns. The Chief of Ordnance states that 106 guns embodying features covered by this patent had been constructed or are under manufacture; that the invention was not adopted for use until after the date of expiration of patent and then through foreign sources.

Bayonet.—Edmund Rice, brigadier-general, U. S. Army, deceased, received a patent upon a so-called "Rice bayonet," and the records of the Ordnance Department of the Army show that 1,000 bayonets covered by this patent were manufactured at the Springfield Armory and tested in the Army. They were rejected for service and none was purchased, and no record can be found of any royalty having been paid General Rice.

Shrapnel.—B. W. Dunn, major, U. S. Army, received patents Nos. 631703 and 735658 upon this invention, and about 25,000 shrapnel

were manufactured under a free license granted to the United States by the inventor. The shrapnel are not used at present.

Blank cartridge.—Lawson M. Fuller, major, U. S. Army, received a patent upon a blank cartridge, which has been extensively used in the Army. Major Fuller states that up to November 1, 1907, 55,700,299 cartridges covered by his patent have been manufactured; that he has never asked any royalty therefor, and no profit whatever has accrued to him by reason of this use of his patent by the Government.

Cartridge machines and clips.—O. M. Lissak, major, U. S. Army, has received the following patents:

No. 800311, machine, cartridge vent detector.
No. 801729, machine, paper tube cutter.
No. 804017, machine, cartridge head gauger.
No. 804018, machine for inserting cartridges and clips.
No. 804145, automatic feed for cartridge machine.
No. 810065, machine for assembling cartridge clips.
No. 810161, cartridge clip.

He states that the "above machines and cartridge clips are in extensive use by the Government. All the small arms cartridges manufactured by the Government pass through these machines, about 50 of the different machines being in use, effecting, with other machines not patented, an annual saving to the Government of between $35,000 and $40,000. The Government has free use of the machines and of the clips."

Referring to this statement the Chief of Ordnance says that the figures showing the saving to the United States are an estimate, and that the patent for the cartridge clip is an improvement on a design already patented by others, not a patent on a new clip.

No license has been granted for the use of the Lissak patents, and nothing has been paid the inventor. A bill was introduced in Congress December 19, 1905, directing the payment of $25,000 to Major Lissak for his services in inventing and improving certain machines for the manufacture of cartridges at Frankford Arsenal.

Cartridge-packing case.—W. R. Livermore, colonel, U. S. Army, retired, and A. H. Russell, colonel, U. S. Army, received patent No. 278980 upon a cartridge-packing case. The records of the Patent Office show that on November 21, 1883, Livermore transferred to Russell one-third of his half interest in said invention and patent. Colonel Livermore states that he believes that the principles involved in this patent have been used in the construction of all the new Springfield magazine rifles in that the cartridges are introduced sidewise into a box magazine at the receiver by means of small prepared packages; that the patent expired before the manufacture of this gun, and that no royalty or profit has been claimed and none has been received. Colonel Russell states that this patent and his patent No. 230823 upon a magazine firearm formed the basis of the modern clip magazine embodied in the United States Springfield magazine rifle, and that this use was adopted after the expiration of the patent.

Ammunition cart.—W. C. Manning, major, U. S. Army, deceased, received patent No. 740673 upon an ammunition cart. The annual report of the Secretary of War for 1902 states that an ammunition

cart, the design of Maj. W. C. Manning, was constructed at a cost of $1,500. The records of the Ordnance Department show that this was the only use of this patent, as the report upon it was unfavorable and that no royalty was paid.

Smokeless powder (Army).—G. N. Whistler, colonel, U. S. Army, received patents Nos. 541909, 541910, 541911, and 666485 upon smokeless powder and processes. It appears that these patents have been used by manufacturers of smokeless powder supplied to the Government. The Adjutant-General states that the first three patents were taken out in 1896, when the inventor was on leave of absence; that he was on duty when he received the last patent in 1901. Mr. John A. Haskell, an employee of the Dupont Powder Company, states that the first three patents were taken out July 2, 1895, in the names of Colonel Whistler and H. C. Aspinwall, and that the last patent was taken out January 22, 1901, in the name of Colonel Whistler and John H. Brown.

The inventor states that while on leave of absence, in connection with the building of the Brown segmental wire gun, he was also engaged with the Leonard Smokeless Powder Company, the American Smokeless Powder Company, and the Laflin & Rand Smokeless Powder Company; that while acting as their consulting engineer and expert, he discovered and invented certain things in connection with smokeless powder and machinery for manufacturing the same; that on July 2, 1895, three patents were taken out in his name and that of H. C. Aspinwall (the first three patents above given), and that on January 2, 1901, in conjunction with John H. Brown, he received the patent last above given; that these patents were taken out for the powder companies, and have always been owned by them, to whom they were transferred for a consideration of $1; that he has never received any royalty, but that while connected with the companies as their consulting engineer he received compensation based upon the profits accruing from smokeless powder; that this ended December, 1901.

Belt plate.—James M. Whittemore, brigadier-general, U. S. Army, retired, received a patent upon a belt plate, and he states that a few cartridge belt plates were made under this patent by the Ordnance Department many years ago, and that if any more have been made he is not aware of it. He has received no profit from the use of this patent. The records of the Ordnance Department do not show that any royalties have ever been paid General Whittemore on any of his inventions.

Cartridge belt weaving machine.—Anson Mills, brigadier-general, U. S. Army, retired, received patents upon machinery for the manufacture of woven cartridge belts, and devices manufactured by said machine are in use in the Army, Navy, Marine Corps, and militia, and have been for many years. It is understood also that they are employed by other countries. The patentee states that he can not give the numbers of his patents; that the belts were manufactured in his own factory and sold to the Government; that over two years since he sold all his interest in both factory and patents. The records of the War Department show that purchases of belts of this nature

during the past nine years, at prices ranging from $0.60 to $2.69 per belt, were as follows:

Date of contract.	Name of contractor.	Total net amount paid or to be paid on contract.
Mar. 28,1898	Thos. C. Orndorff	$264,191.20
Feb. 15,1899	do	43,750.00
Sept. 5,1899	do	43,750.00
Dec. 20,1899	do	131,250.00
July 12,1900	do	87,500.00
July 11,1901	Anson Mills Woven Cartridge Belt Co	100,875.00
Sept.26,1903	do	176,000.00
Oct. 18,1904 (order).	do	14,015.40
Jan. 3,1906	do	37.58
May 2,1904	Russell Manufacturing Co	85,491.94
Nov. 2,1905	Mills Cartridge Belt Co	188,000.00
Mar. 2,1906	do	37,600.00
May 14,1907	do	253,659.00
May 29,1907	Russell Manufacturing Co	53,800.00
		1,479,919.72

It is not known which of these companies have employed the Mills patents, and under date of December 3, 1907, the patentee was requested to inform the Bureau upon this point, but nothing has been received from him in reply therto.

The records of the Marine Corps show that with one exception cartridge belts for use in the Marine Corps have been procured from the Ordnance Department of the Army. In the one case referred to, proposals were forwarded to five firms located in New York and Philadelphia, and to the Anson Mills Woven Cartridge Belt Company, Worcester, Mass. No advertisement was inserted in the newspapers. The form of proposal called for 2,000 Anson Mills woven cartridge belts, double loop for caliber .30 cartridges, gray color; or similar in design or quality thereto. But one bid was received, that one being from the Anson Mills Woven Cartridge Belt Company at $1.75, and the ward was made to that company December 4, 1903.

The Bureau of Ordnance, Navy Department, was requested on November 11, 1907, to furnish the quantities of belts of this description purchased and the amounts paid therefor, but no reply has been received from that Bureau.

Capt. H. R. Lemly, U. S. Army, retired, states that he owns 250 shares of stock in the Mills Woven Cartridge Belt Company.

The Merriam pack.—H. C. Merriam, major-general, U. S. Army, retired, is patentee of an improved method of carrying a soldier's kit in the field, patent No. 494216. It was used experimentally in the Army at various times. The Secretary of War, in his annual report, 1902, states that 1,000 of these packs were purchased and distributed to ten regiments of infantry for trial.

Stacking swivel.—Henry Metcalfe, captain, U. S. Army, retired, received a patent about 1875 upon a stacking swivel in use in the Army. Captain Metcalfe states that he has had no interest in this patent since its sale, about thirty years ago, for $500, and he has received no profit or royalty for its use since that time from any source whatever. He has no certain knowledge of the extent of its use, but believes that it is used almost all over the world.

Gun-sling attachment.—Leighton Powell, lieutenant, U. S. Army, obtained patent No. 784430 upon a gun-sling attachment, which is now undergoing service tests in the Army.

Neck yoke counter stock.—Franz Wenke, blacksmith, Quartermaster's Department, U. S. Army, Fort Reno, Okla., received a patent in May, 1903, upon this invention, which is in use on all field artillery carriage poles in the Army. It was accepted by the United States Ordnance Department in June, 1904. The Chief of Ordnance states that the Department pays a royalty of 50 cents for each of these articles; that royalty has been paid upon 1,329, all of which were manufactured by the Government.

Depression position finder.—C. C. Hearn, captain, U. S. Army, received a patent upon this invention and it was submitted for test but not accepted. Permission was granted for a further test, and it is now being remodeled for such test.

Depression position finder.—W. C. Rafferty, major, U. S. Army, received a patent upon a depression position finder, 53 of which are in use in the Army and Navy. The inventor received a royalty of $50 per instrument, or a total of $2,650.

Depression range and position finder.—I. N. Lewis, major, U. S. Army, took out three patents upon these instruments, which were adopted for general use for the coast armament by the Board of Ordnance and Fortification in 1896. In all, 200 have been installed, and a new model, not patented, is now under test for adoption. The instruments have been patented in Europe, but the foreign patents have not been sold, and no instruments have been sold for use abroad. The inventor states that a number of instruments and devices patented by him are in general use in the adopted system of coast defense, but that patent protection for such inventions has not been obtained or applied for. He further states that he has no royalty or other pecuniary interest whatever in the manufacture for, or sale to, the Army, the Navy, or other departments of the Government on any of the instruments or apparatus named. He has patents upon eight other inventions relating to the subject of electricity and ordnance, which are not in use by the Government.

Depression position finder.—G. N. Whistler, colonel, U. S. Army, jointly with C. C. Hearn, captain, U. S. Army, patented a depression position finder, now the property of the Keuffel & Esser Company. It is not in use, but is undergoing test.

Range finder.—Sedgewick Pratt, brigadier-general, U. S. Army, retired, received patent No. 434950 upon a range finder, and 23 instruments covered by this patent have been disposed of to the Government at a total cost of $341, the profit to the inventor amounting to $113. He has received no royalty for the use of this patent.

Electro-chronographs.—A. H. Russell, colonel, U. S. Army, received patent No. 174444 upon an improvement in electro-chronographs, which is used with the Schultz chronographs for ballistic purposes. The Chief of Ordnance states that several chronographs have been fitted with devices embracing features covered by this patent; that no payment has been made and none has been asked.

Reflector for inspecting guns.—A. H. Russell, colonel, U. S. Army, has been granted patent No. 399286 upon a reflector for inspecting guns. The Chief of Ordnance states that a few instruments covered

by this patent are in use in the Army, for which no payment is asked.

Saddle.—Royal E. Whitman, captain, U. S. Army, retired, received a patent upon a saddle which has been used in the Army. The records of the Chief of Ordnance show that since the expiration of the patent 1,099 saddles, involving the Whitman patent, have been manufactured by the Ordnance Department at the Rock Island Arsenal and sold to officers, and that the Whitman saddle is not a regular article of issue. No saddles covered by the Whitman patent have been purchased and no royalties have been paid thereon. Those used by officers prior to the expiration of the patent were purchased by them personally from dealers, and, as to this, the records of the War Department, of course, contain no data.

Spur.—Anson Mills, brigadier-general, U. S. Army, retired, received a patent, the number of which he does not know, upon a spur. He states that spurs were manufactured under his patent by the Ordnance Department of the Army and used by the Government without royalty or profit to him. The Chief of Ordnance states that 1,000 pairs of these spurs were fabricated by the Ordnance Department, Rock Island Arsenal, during the years 1880 and 1881, being 500 pairs of pattern "A," at a cost of 94 cents per pair, and 500 pairs of pattern "B," at a cost of 79 cents per pair.

Bits and bridles.—H. A. Sievert, captain, U. S. Army, has received patent No. 773429 upon a bridle bit, the object of which is to provide a bit capable of being used as a curb or lever bit and a snaffle bit with rein attachment for a lever action, especially adapted to the trooper. He also received patent No. 838656 upon a bridle constructed of two strips without any stitching. He states that the use by the Army of his bits and bridles has been confined to his troop. The office of the Chief of Ordnance contains no record in reference to the patents of Captain Sievert, except that a bit patented by him, and manufactured by him, was furnished in a limited number for trial by the cavalry board, and was adversely reported upon; no arrangement was made with the inventor for the use of his invention.

SUBSISTENCE.

Can-opener scissors.—E. A. Wheeler, clerk, Subsistence Department, U. S. Army, received a patent upon can-opener scissors, and about 2,000 articles covered by his patent were purchased for the use of the Army in 1900. It appears that the device was found unsuitable and no more were purchased. Since the purchase of the 2,000 can-opener scissors covered by the Wheeler patent, the records of the office of the purchasing commissary, U. S. Army, New York City, show that 13,000 can-opener scissors have been purchased from the Francis T. Witte Hardware Company. There is no record, either with the hardware company or with the purchasing commissary of any patent covering this device, and an examination of the scissors fails to disclose any patent mark. It is practically certain, therefore, that the 2,000 first above referred to are all that have been purchased covered by the Wheeler patent. Mr. Wheeler states that the can openers were purchased by the Subsistence Department in the open market, and that he has received no royalty or profit from the Government.

Field ranges or ovens.—Francis H. Buzzicott, formerly a private, U. S. Army, received a patent upon what is known as the Buzzicott field range, which has been extensively used in the Army. The records of the Quartermaster-General's Office show that field ranges of the Buzzicott pattern have been purchased to the extent of 5,731, at prices ranging from $14 each to $38.50 each. The aggregate of purchases to date amount to $187,357.87. The Commissary-General, who now has charge of supplying devices of this kind, states that no complete Buzzicott outfits have been purchased recently; some few were turned over by the Quartermaster's Department. Since July 1, 1907, purchases of Buzzicott ovens have been limited to repairs to ranges already in use, and have been all made from the Standard Range and Furnace Company, of Louisville, Ky., usually after advertisement. The total amount of money expended for repairs and equipment with this firm for Buzzicott ranges is $278.38. No arrangement exists between Mr. Buzzicott and the Government for the use of his invention.

Emergency food.—L. G. Billings, pay director, U. S. Navy, made an application for a patent upon emergency food about 1896 which was rejected. Pending the proceedings in his case he sold his interest in the invention for $500 and a royalty of 2 cents per can for sales to foreign governments or private parties, but expressly stipulated that he was to receive no royalty or interest whatever on any orders placed by the United States Government and no compensation whatever from the Government. While the records of the office of the Commissary-General do not show that any food manufactured under this patent has been purchased, the inventor believes that the Army has used the food and is now using it in a modified form.

Vegetable peeling machine.—Thomas Franklin, captain, U. S. Army, together with George L. Belding, manager of the Cadet Laundry, West Point, were the owners of a patent dated February 25, 1907, upon a vegetable peeling machine which has been sold and assigned to the Belding & Franklin Machine Company, 54 West Thirtieth street, New York City. The Belding & Franklin Machine Company state that they have sold 19 peeling machines to the various branches of the Government at $250 each.

MEDICAL DEPARTMENT.

Improvement in bottles.—E. L. Munson, major, Medical Department, U. S. Army, secured a caveat in 1902 to protect the Government in the use of an improved bottle, which in 1903 was adopted as a part of the regulation equipment of the Army Medical Department. Two thousand bottles of different sizes were purchased. After a thorough trial they were found not to be adapted to field service, and further use of them was discontinued in 1905.

Flash-light photography.—Edgar Russel, major, U. S. Army, retired, received patent No. 853035 upon flash-light photography and 170 devices covered by this patent have been issued by the Medical Department for use in the Army. The records of the Patent Office show that on May 21, 1907, the patentee granted a license to the Government for the term of the patent to manufacture and have manufactured for use of the United States only such number of apparatus for the flash-light photography covered by said letters patent as may from time to time be necessary to meet the needs of the War Depart-

ment and the Army. The Surgeon-General states that these devices are purchased from the National Electric Supply Company. That firm states that it has furnished them at $17.20 each and pays no royalty to anyone.

QUARTERMASTER.

Sibley tents.—H. H. Sibley received a patent upon a tent which has been extensively used in the Army. He sold a half interest in his patent to Maj. William W. Burns, U. S. Army, and a contract was entered into between the inventor and the War Department February 18, 1858, giving the Department the right to manufacture and use the tent on a basis of a certain royalty per tent manufactured. From March 6, 1858, to February 2, 1861, 3,643 tents were manufactured, on 50 of which a royalty of $10 per tent was paid, and on the balance a royalty of $5 per tent, making the total royalty received under this arrangement $18,465, paid to H. H. Sibley and Maj. W. W. Burns, U. S. Army.

H. H. Sibley identified himself with the Confederate army shortly after the beginning of the civil war, after which no royalty was paid to him. On September 3, 1861, 206 tents were procured, on which a royalty of $2.50 was paid to Major Burns only, making a total of $515. Subsequent to August 31, 1861, 44,102 Sibley tents were manufactured, of which 935 were made after 1873, the date on which the patent in question expired.

Under judgment of the Court of Claims, of November 29, 1871, a royalty of $2.50 each, with interest, was paid to Major Burns on 40,497 tents, and the records of the Quartermaster-General's Office show that an additional $5,000 was paid to the heirs of said W. W. Burns on account of royalties which it is presumed is based on the remainder of the tents on which no royalties have been paid (2,650). It appears, therefore, that the total royalty paid by the Government for the use of this patent in its manufacture of tents has been $125,222.50, plus the interest allowed by the Court of Claims, $11,857.85, or a total in all of $137,080.35.

Shelter tent and clothing roll combined.—Charles W. Williams, major, U. S. Army, deceased, received a patent, No. 596767, upon shelter tent halves and clothing roll combined, under the terms of the act of March 3, 1883, which authorizes the granting of a patent upon an invention to be used in the public service without the payment of any fee, provided the patentee dedicates the use of the invention to the Government or to any other person in the United States without the payment of any royalty thereon. The Quartermaster-General states that the records of his office show that 242,830 devices covered by this patent have been manufactured since the granting of the patent.

Shelter tent.—E. Rice, colonel, U. S. Army, deceased, received a patent for an improvement in attaching fastenings to tents. The claim of the widow of Colonel Rice for infringement of his patent by the Government is pending in the Court of Claims. The War Department holds that the Rice patent is invalid for want of novelty, and that it is not manufacturing any tents conforming to the Rice patent. No royalty has therefore been paid for the use of the Rice patent. The annual report of the Secretary of War for 1897 stated

that the Rice tent was simply an exact reproduction of the United States regulation shelter tent, having a few straps attached in which to carry articles of clothing. The royalty demanded was deemed excessive and no tents were purchased. In his report for 1902 the Secretary of War states that an allotment of $600 was made on December 20, 1899, to test the Rice tents at Plattsburg Barracks, N. Y., but no report had been received as to their value.

Asbestos shield for stovepipe.—W. C. Browne, major, U. S. Army, received patent No. 511502, for an asbestos shield for stovepipe to be used in tents. Major Browne transferred his patent to the H. W. Johns-Manville Company, of New York, and, in 1899, 5,000 of these shields were purchased by the Quartermaster's Department for use in the Army. Major Browne is on duty in the Philippine Islands, and the bureau has not yet learned from him the terms of his arrangement with the manufacturers. Later, bids were advertised by the Government for a number of asbestos tent shields, and the Johns-Manville Company and the Magnesia Covering Company, of Philadelphia, submitted bids. The contract was awarded to the Magnesia Covering Company, and the owners of the Browne patent notified said company that in case they obtained the contract the Johns-Manville Company would sue them under the Browne patent. The Magnesia Covering Company accepted the bid and filled the contract, and as a result a suit in equity has been instituted, which is now pending. The Magnesia Covering Company claims that the Browne patent is void for want of novelty.

Improved tent.—E. L. Munson, major, Medical Department, U. S. Army, was granted a patent January 2, 1900, upon a tent. He immediately made over, in writing, gratuitously, all rights for its use by the Government. The records of the office of the Quartermaster-General show that 223 hospital tents and 150 hospital tent flies of the Munson pattern have been manufactured by the Quartermaster's Department. The Munson tent has been a part of the regulation field equipment of the Medical Department of the Army and has been used by the Navy and Marine-Hospital Service. No tents of the Munson pattern have been manufactured since December, 1903, and no additional manufactures of this style of tent are contemplated by the Quartermaster's Department.

Pack equipment.—John W. Pullman, colonel, U. S. Army, received a patent upon a pack equipment and gave the Government a license to use it without charge. He assigned the patent to C. W. Hayes, Washington, D. C. The Quartermaster-General states that approximately 42 of these outfits have been manufactured and used about military posts and depots, and it is not contemplated to manufacture any additional ones in the near future, in view of the fact that reports of tests have not been entirely satisfactory.

Steel ribbing for aparejos.—H. W. Daly, chief packer, Quartermaster's Department, Fort Leavenworth, Kans., received patents Nos. 648236 and 791407 upon steel ribbing for aparejos. This device is designed to overcome the constant necessity of "setting up" aparejos, as was necessary under the old willow-stick method. The patents cover, also, wooden pads and ribs (flat), introduced into the aparejos to make unnecessary the expertness required in ribbing and filling the aparejos properly. Devices covered by the patents are manufactured at the Rock Island Arsenal and supplied to mountain batteries and

machine-gun platoon detachments. Forty-four were manufactured at St. Louis, Mo., for use in the Engineer Corps, Fort Leavenworth, Kans.; a few are in use with the Signal Corps, Fort Leavenworth, but the inventor is unable to state to what further extent the device is in use. The Quartermaster-General states that ribbing covered by the Daly patents has been used in the construction of approximately 42 Pullman pack outfits and 20 specially constructed aparejos for use in connection with the wireless telegraph pack outfits in the Signal Corps of the Army. He further states that no royalty is paid to Mr. Daly for the use of his patents and that they have been practically assigned to the Government. The inventor states that these patents were devised by him as a result of observation during the Spanish-American war, 1898, to better the conditions of the pack service, and that he has not entered into any agreement with the Government for their use.

Hermetically sealed tin boxes.—H. W. Daly, chief packer, Quartermaster's Department, Fort Leavenworth, Kans., received patent No. 671817 upon this invention, which is used for holding ammunition and other supplies needed by troops in the field that might deteriorate by exposure to rain and dampness. The article has been in constant use since 1900, being manufactured by the Ordnance Department in a modified form. Mr. Daly states that the device in use is in the form in which he sought to secure a patent, but some other party had anticipated his invention, namely, the method of removing the covering by means of a wire handle attached to a section sealed on top of the tin box. The Quartermaster-General states that no royalty is paid to Mr. Daly for the use of his patents, as they are practically assigned to the United States. The inventor states that these patents were devised by him as a result of observation during the Spanish-American war, 1898, to better the conditions of the pack service, and that he has not entered into any agreement with the Government for their use.

Wooden box to carry tin box.—Mr. Daly received patent No. 794663 upon a wooden box provided with metallic fastener so as to connect the several boxes when on a pack mule and secure it so as not to require the aid of an expert packer, as with the diamond-hitch method. The interior of the wooden box is so arranged as to permit the extraction of the sealed tin boxes in from four to five seconds. The device is used by the Signal Corps and fourteen were manufactured in St. Louis and tested with the provisional field artillery at the maneuvers at Fort Riley, Kans. The Quartermaster-General states that no royalty is paid to Mr. Daly for the use of his patents, as they are practically assigned to the United States. The inventor states that these patents were devised by him as a result of observation during the Spanish-American war, 1898, to better the conditions of the pack service, and that he has not entered into any agreement with the Government for their use.

Box for packing campaign hats.—The Bureau was informed in the course of the investigation that patent No. 672259 had been granted to James M. Stewart, an employee of the office of the Quartermaster-General, for a box used in that department for packing campaign hats. The records of the Patent Office show that this patent was taken out in the name of Letitia E. Stewart, of Washington, D. C., and Henry Schmidt, of Philadelphia, Pa. The records of the office

of the Quartermaster-General show that during the past twelve months devices covered by this patent have been purchased to the extent of $4,200 from Henry Schmidt & Bro., of Philadelphia, Pa. As neither of the patentees is an employee of the Government, this case does not come within the terms of public resolution No. 15, but in view of the fact that it seemed to be the impression of the office of the Quartermaster-General and elsewhere that this device was the invention of an employee it was thought desirable to make this much of a report thereon.

Sandpaper holder.—Frederick Reissmann, post quartermaster-sergeant, West Point, N. Y., received a patent upon a sandpaper holder for use of mechanics in 1903. This device has been supplied by the Quartermaster's Department with tool boxes furnished to mechanics at army posts. The inventor states that 900 sandpaper holders have been purchased by the Government, on which he received a royalty of 2 cents each, making a total of $18.

Rule gauge.—Frederick Reissmann, post quartermaster-sergeant, West Point, N. Y., received a patent upon a rule gauge for use of carpenters in 1896. Devices covered by this patent are supplied by the Quartermaster's Department with tool boxes furnished to mechanics at army posts. The inventor states that 900 rule gauges covered by his patent have been sold to the Quartermaster's Department, on which he received a royalty of 3 cents each, making a total of $27.

Foot valve extractor.—Richard Titsworth, blacksmith, Quartermaster's Department, U. S. Army, Fort Bliss, Tex., received a patent, No. 759407, on a foot valve extractor for deep wells. One of them has been in use at Fort Bliss, Tex., to a limited extent, by permission of the inventor and without compensation therefor.

SIGNAL CORPS.

Method of sending electro-magnetic waves.—Leonard D. Wildman, captain, U. S. Army, received patents Nos. 764093 and 764094 upon a method for sending electro-magnetic waves of a certain definite length and for a protector device for electro-magnetic currents. Both patents are dedicated to the public under the terms of the act of March 3, 1883, and are in active and present use in Alaska and the Philippines. The Chief Signal Officer is unable to state the exact number of devices in use covered by the Wildman patents, as there are a number of other patents upon similar devices employed in the Signal Corps.

Carborundum wireless receiver.—H. H. C. Dunwoody, brigadier-general, U. S. Army, retired, received patent No. 837616 upon a carborundum wireless receiver, two of which are in use on two of the vessels of the Revenue-Cutter Service in connection with the De Forest system of wireless telegraphy. General Dunwoody states that he sold all his right, title, and interest in said patent to the United Wireless Telegraph Company. Articles covered by this patent are not used by the Signal Corps of the Army. The Chief of the Bureau of Equipment of the Navy Department states that about a year ago some Dunwoody detectors were submitted for test. The report indicated that they were not as efficient as those already in use and they were dropped.

Telephone attachment for telegraph lines.—Edgar Russel, major, U. S. Army, retired, received patent No. 724336, covering this attachment, and 194 devices under this patent have been used and are in use by the Signal Corps. The records of the Patent Office show that on December 3, 1901, the patentee granted a license to the Government to manufacture and use said device throughout the term of the patent or any further application that may be made to perfect the same, provided the right to manufacture and use said device shall be limited to such number as may be required for use of the War Department and the Army, and shall not authorize the sale of same by the United States.

Telegraph relay.—James Allen, brigadier-general, U. S. Army, received patent No. 814501, covering a telegraph relay. The records of the office of the Chief Signal Officer show that six instruments covered by this patent have been ordered and are in use by the Signal Corps of the Army. They were supplied through the Weston Electrical Instrument Company of Newark, N. J. The instruments were supplied by this company, on quotation of prices, royalty free to the Government. The inventor states that devices covered by his patent may be used by the Government free of cost.

Finley optical telegraph.—John P. Finley, captain, U. S. Army, received patents in 1885–1888 upon an improved system of optical telegraph for military purposes, to be used either by day or night. The patentee states that certain parts of his invention are now in use in the Army; for example, the sighting rod with micrometer screw attachments and shutter attachments. The Chief Signal Officer states that the only optical telegraph instruments in use by the Signal Corps of the Army consist of the standard heliographs, which are purchased from manufacturers after public advertisement and specifications calling for proposals in the usual manner, and nothing is known of the relation of Captain Finley to any device used by the Government.

Commercial system of cypher.—A. W. Greeley, major-general, U. S. Army, received a patent, number unknown, upon a system of cypher which is not in use in the Army or Navy, although some of the principles involved have been employed, without expense to the United States, in the preparation by General Greeley of the War Department telegraphic code.

ENGINEERING.

Combined breakwater and paved beach.—W. L. Marshall, colonel, U. S. Army, received a patent on an improvement in shore protection, being a combined breakwater and paved beach. The breakwater is in use on some harbors on the Great Lakes. No royalty has been paid by or is expected from the United States. The invention is in use by private parties along the lake front, Chicago, for which $13,800 has been paid in royalties.

Fitting for pipe railing.—A. C. Both, assistant engineer, and C. F. Porter, chief clerk, engineer's office, Portland, Me., jointly received a patent in 1901 upon a fitting for pipe railing. About 500 of these fittings are in use on the Portland Harbor defenses. No royalty of any description has been received.

Movable dam.—B. R. Thomas, United States engineer's office, Cincinnati, is the patentee of a movable dam which is now in use by

the United States in one section of Dam No. 6, Ohio River, near Beaver, Pa. By written agreement no royalty has been paid or is to be paid for its use.

Hurter for Chanoine wicket.—B. R. Thomas, United States engineer's office, Cincinnati, and J. C. Thomas are patentees of this device, which is in use by the United States on Dam No. 6, Great Kanawha River, near Charleston, W. Va. By written agreement no royalty has ever been or is to be paid for its use.

Screw anchor for grading hose.—John J. Ryan, blacksmith, United States engineer office, Memphis, Tenn., received a patent a good many years ago, while an employee of the Government, upon a screw anchor for grading hose. The engineer office at Memphis reports that according to the best information Ryan built one of these anchors and presented it to the assistant engineer in charge for use instead of the stake then in use for the same purpose. Whether the original model was made on Government time or not is not known, but the impression is that it was so made. The device has been used since that time, and there are about a dozen now in use in that district. No arrangement was made with the inventor for its use, as it was considered one of the improvements in the working plant.

Rock drills.—G. McC. Derby, lieutenant-colonel, U. S. Army, retired, patented two drills about 1883. Colonel Derby states that they were extensively used by the Government at Hell Gate, New York Harbor, and that he never received any compensation or royalty from the use of these drills.

Suction head for hydraulic dredging.—E. O. Patterson, master of dredge, engineer's office, New Orleans, received a patent upon a suction head used in connection with hydraulic dredging. During the use of his invention a royalty of one-fifth of a cent per cubic yard of material dredged was paid to him. The records of the office of the Chief of Engineers disclose that payments aggregating $3,299.96 have been paid to the inventor for royalties on the use of the drag suction head. The Chief of Engineers states that he believes that, in addition, a royalty was paid to the inventor for each drag manufactured under his patent, but this can not be verified, and the amount so paid, if any, is not known. This invention has not been in use by the Engineer Department since November, 1900.

Power steering gear.—Charles R. Suter, brigadier-general, U. S. Army, retired, received a patent (number unknown) upon a power steering gear for steam vessels. This invention was used by the War Department prior to 1880 and for some years subsequently, but the inventor is not able to state whether it is in use at the present time. The inventor states that machines were built under this patent for three United States snag boats on the Mississippi River, and that the makers paid him royalties thereon amounting to $300.

Bear-trap weir.—W. A. Jones, brigadier-general, U. S. Army, retired, received patents Nos. 425231 and 552063 upon a bear-trap weir, being a gate for controlling the opening in a dam. Three of these gates were built by the Engineer Department at Sandy Lake Dam, Minnesota, in 1897, at a cost of $9,500. The inventor does not know of its use elsewhere. He now has a one-third interst in it, and it is known as Lang's patent bear-trap weir. No royalty or other profit has accrued to the inventor by reason of the use of his invention by the Government.

Compensator for controlling speed.—Henry M. Robert, brigadier-general, U. S. Army, retired, was assignee to a part interest in patents, dated about 1893, issued to Luigi d'Auria upon a compensator for controlling speed of pumping machines or air compressors. One of these machines was in use at the Government Hospital for the Insane. General Robert states that he assigned his interest in the patent, receiving in exchange some common stock in the d'Auria Pumping Engine Company, which has never paid a cent of dividends and probably never will. The patents have nearly expired.

All-metal packing.—F. T. Nolan, steam engineer, U. S. engineers office, Jacksonville, Fla., is the patentee of an all-metal packing, one of which is at present in use of the dredge *Florida*. The patentee has received no royalty for the use of the article.

Hydraulic dredging machine.—J. W. Sackett, chief assistant engineer, U. S. engineers office, Jacksonville, Fla., received patent No. 508766, on a hydraulic dredging machine, which has been in use on the dredge and snag boat *Suwanee* for thirteen years, and on the dredge and snag boat *Florida* for two years. Portions of the apparatus patented have been in use on the dredge *Jacksonville* for two years. No royalties have been asked or paid.

Roller track.—D. C. Kingman, lieutenant colonel, about 1888, received a patent jointly with another person for an improved roller track, especially designed for use in the construction of elevator dredges. It was used upon one, and probably upon a second United States dredge; no royalty was asked or paid. It was used upon two private dredges for which a royalty was paid in each case of $250.

Tide-indicating apparatus.—Alexis Le Blanc, electrical engineer, United States engineer's office, New York City, received patent No. 664328 upon a tide-indicating apparatus used by the Government. The inventor states that the royalties on these instruments are $50 each on transmitting instruments and $20 each on indicators, and that the use of these instruments by the Government was abandoned several years ago when the Signal Corps adopted the Whistler meteorological and tide-controller system. The chief signal officer states that one set of instruments was constructed under the Le Blanc patent; that it was purchased in 1903 for use at Fort Mason, Cal.; that these instruments were in use only a short time and are probably now set aside; that they were purchased through Foote, Pierson & Co., 160 Duane street, New York City, who quoted the price of manufacture and who were presumably the agents of the inventor. This firm states that it has sold to the United States engineer's office, Army Building, New York City, Le Blanc devices to the amount of $490, and to the United States Signal Corps, Washington, D. C., similar devices to the amount of $2,750. The Whistler system above referred to is the invention of Col. G. N. Whistler, U. S. Army. The Chief of Ordnance states that only one device involving the Whistler patent was constructed and that this one was made up for test.

Concrete mixer.—Peter C. Hains, captain, U. S. Army, with C. Raymond Weaver, received a patent upon a concrete mixer which, the district engineer states, was used in building one of the batteries at Fort Carroll, Md., in 1898; that subsequently it was used in the construction of battery George Sykes and the sea wall at Fort Smallwood, Md., in 1903; that in the latter case permission in writing to use the plant without cost to the Government is on file in his office, and in

the former case it is understood that such permission was given orally, as there is no record of any payment or any claim for payment on account of the use of this mixer. Captain Hains states that his concrete mixer, so far as he is aware, has never been employed by the Government, and that no terms of agreement have ever been made with the Government concerning its use.

Sketching case.—M. A. Batson, captain, U. S. Army, retired, received a patent about 1897 upon an instrument for making rapid reconnaissance maps which has been used by the War Department. The records of the office of the Chief of Engineers show that 71 Batson sketching cases have been purchased; that no terms were made with the inventor for the use of his device, which was bought in the usual manner from instrument dealers advertising them for sale. The firm supplying this device was W. & L. E. Gurley.

Ammunition hoist.—D. E. Hughes, assistant engineer, U. S. engineers office, Los Angeles, Cal., received patent No. 774476 for an ammunition hoist. The inventor claims that the chain hoists, now in use in seacoast fortifications, are covered by his patent as to their essential features. He has voluntarily conveyed to the Government the perpetual right to use the device covered by his patent without cost.

Ammunition hoists and conveyors.—H. F. Hodges, lieutenant-colonel, U. S. Army, received patents Nos. 604828 and 695050 upon improvements in ammunition hoists and conveyors. The former of these patents has been used somewhat extensively, and the latter to a less degree by the United States at the seacoast batteries; in all, about 100 hoists have been installed. The patents were taken out to protect the United States, and the inventor has not asked or received any royalty for their use. He states that he refused a favorable offer for the sale of the patent rights as against the Government.

Hoisting machinery.—R. R. Raymond, captain, U. S. Army, received a patent about 1900 upon hoisting machinery used by the Government. The Chief of Engineers states that he understands that Captain Raymond has assigned his interests in the patent to Henry B. Newhall, of New York City. The district engineer officer at Boston, Mass., states that two hoists for Battery Field were purchased under authority October 9, 1899, at $690 each, from Robert S. Bishop, 31 Broadway, New York City, Bishop having been authorized to manufacture and furnish to the United States for use at Nantasket, Boston Harbor, two 5-inch ammunition lifts. Two are in use in Battery Daniel McCook and two in Battery Amiel Whipple, which were purchased under emergency contract with Ellicott Machine Company, Baltimore, Md., under authority of August 19, 1901, for the lump sum of $1,638. The specifications attached to this contract stated that the Government had been notified by Henry B. Newhall, 26 Courtlandt street, New York City, that he was the owner of patent rights which covered parts of the mechanism of the lifts, and that each bidder must assume all responsibility for infringement and protect the Government against all claims made. Two are in use in Battery James Rice, purchased under authority July 3, 1900, from the Champion Iron Company, Kenton, Ohio, at $335.

The inventor states that his contract of assignment required the payment of $50 to him for each machine manufactured or licensed to be manufactured; he does not know how many machines have been

manufactured, or how many have been bought by the Government; that the assignment was agreed upon before the use of his machine was contemplated by the Government; that the invention was made on his own initiative without any orders or assistance from the Government; that the machines purchased by the Government are not the same as those patented, but include certain features covered by the patent.

Platform for searchlight projectors.—E. H. Shulz, captain, U. S. Army, received patent No. 777644 for an improvement in a protective disappearing platform for searchlight projectors. A platform based on this patent has recently been constructed by the War Department at Fort Terry, N. Y. The patentee has dedicated the use of the invention to the Government, or any person in the United States, without payment of royalty thereon.

MISCELLANEOUS.

Medal of honor.—G. L. Gillespie, major-general, U. S. Army, retired, took out design patent No. 37236 upon a medal of honor adopted by the War Department in 1904. The Adjutant-General states that this patent was taken out in the interest of the War Department to prevent imitations and improper use of the medal of new design, and it was assigned to the War Department by General Gillespie for a nominal consideration. General Gillespie is not the inventor of the design.

Jumping bar.—O. M. Lissak, major, U. S. Army, received patent No. 811417 upon a self-replacing jumping bar, which is in free use in the West Point gymnasium.

POST-OFFICE DEPARTMENT.

Brass grommet for mail bags.—B. L. Andrus, superintendent of the mail lock repair shop, received patent No. 624150 upon a conical pointed grommet for mail bags, which is extensively used upon registered-mail pouches, mail sacks, and ordinary mail pouches. The inventor has assigned the right to use his invention to the Government, in writing. He states that but for the fact that he is an employee of the Government he would not have permitted the manufacture and use of his invention without the payment of a suitable royalty or at least $10,000 for the patent.

In this connection the Second Assistant Postmaster-General states that the mail-bag repair shop and the postal service uses a number of locks, label cases, tubular rivets, dies, and special tools, all of which are patentable, and which have been invented by employees connected with the division of equipment, but as there has been no fund available out of which to pay for the preparation of drawings, specifications, etc., the devices have been put into use from time to time without being patented, but after preliminary searches have been made in the Patent Office at the expense of the inventors; that from some of these inventions great savings have accrued to the Government, and that in one case, that of a mail pouch which makes a saving in weight of 2 pounds and 7 ounces per pouch, hundreds of thousands of dollars have been saved to the Government in the item of transportation alone.

Letter-box fastener.—Charles F. Boss, of the supply division, Post-Office Department, is the inventor of a letter-box fastener, which is

on trial by the Government. He stated in an interview that he had not yet applied for a patent; that in case his invention is adopted he has stipulated that the Government shall have the use thereof without any profit to him.

NAVY DEPARTMENT.

ORDNANCE.

Rapid-firing gun.—Seaton Schroeder, captain, U. S. Navy, together with W. H. Driggs, commander, U. S. Navy, retired, received a patent upon a rapid-firing gun known as the "Driggs-Schroeder" gun. The inventors state that they never received any royalties or money in any way from the Government for the use of their invention, and that all their rights and interests in the invention were sold to the American Ordnance Company in 1896. Guns covered by this patent have been used by the Government. The records of the Bureau of Ordnance show that 259 of these guns have been purchased from various parties at prices ranging from $600 to $2,930.40 (the latter price including mounts), making a total of $364,860.80. The amount of profit accruing to the inventors is not known.

The records of the Ordnance Deparment of the Army show that 41 Driggs-Schroeder guns and mounts of various sizes have been purchased at a total cost of $88,350.

Mounting for rapid-firing guns.—Frank F. Fletcher, commander, U. S. Navy, received patent No. 457641 upon a mounting for rapid-fire guns, which has been used by the Navy. The records of the Patent Office show that on August 18, 1891, Fletcher granted a license to the Bureau of Ordnance, Navy Department, to manufacture two mountings for rapid-fire guns under said letters patent, and to employ the same for the purpose for which they were designed; consideration, $80. Commander Fletcher referred to the Bureau of Ordnance as the proper source of information with regard to the use of this and his other patents. That Bureau was communicated with on December 13, 1907, but did not furnish the information requested.

Ordnance.—William H. Driggs, commander, U. S. Navy, retired, has received a number of patents individually and jointly upon devices connected with ordnance and ammunition, as follows:

	Patent No.	Article patented.
W. H. Driggs	469631	Banding shell.
Do	475545	Semiautomatic gun.
Do	493987	Firing mechanism.
Do	502178	Recoil mount.
Do	547423	Sight for ordnance.
W. H. and L. L. Driggs	579261	Field carriage.
W. H. Driggs and V. C. Tasker	625326	Semiautomatic gun.
W. H. Driggs	664732	Gun mount.
Do	682535	Field recoil mount.
Do	781503	Full automatic gun.
Do	805272	Semiautomatic gun.
Do	818943	Fuse for shell.
Do	839124	Electric firing mechanism.
Do	866441	Apparatus for pointing guns.
Do	867258	Semiautomatic attachment.
W. H. Driggs and S. Schroeder	378828	Breech mechanism.
W. H. Driggs	360798	Do.
Do	419143	Fuse for projectiles.

The inventor states that with the exception of patent No. 866441, which he still owns, all these patents were transferred to some ordnance company. Some of the companies have gone out of business, so he is not able to give the names of the present owners. He believes, however, that they are the American and British Manufacturing Company, the United States Rapid-Fire Gun and Power Company, and the Driggs-Seabury Ordnance Corporation. He further states that some of the patents were not made use of, but a majority of them were used in filling contracts for the Army and Navy; that the companies got orders for a considerable amount, but he is not able to state what that amount is; that no arrangement was ever made by him with the Government for the use of any patent; that some 3-inch and 1-pounder guns are building at the Washington Navy-Yard under a license from the Driggs-Seabury Ordnance Corporation, but he does not know how many; that a royalty of $100 for each 3-inch and $30 for each 1-pounder is paid; that he has never received any royalty or pay from the Government for any invention.

The inventor further states that in one instance he was paid by a company manufacturing fuses under one of his patents a small amount of money (a few hundred dollars), but that this was discontinued some fourteen years ago; that, except in the manner explained, he has had no connection with the furnishing of guns or other material to the Government.

The records of the Bureau of Ordnance show that under a license from the Driggs-Seabury Ordnance Corporation for the manufacture or conversion of 1-pounder guns under patents Nos. 625326 and 805272 a royalty of $30 each is paid, and under a further license for the manufacture of guns of from 1.75 to 4 inch caliber, under patents Nos. 625326, 805272 (and 818942 of L. L. Diggs alone) and application for patent No. 311537, a royalty of $100 each is paid. Under these licenses there have been ordered manufactured at the Washington Navy-Yard 125 1-pounder and 112 3-inch guns.

Counterpoise carriage.—J. A. Howell, rear-admiral, U. S. Navy, retired, received a patent upon a counterpoise carriage which was used by the Government. The Annual Report of the Secretary of War for 1896 states that an appropriation of $50,000 was made for the purchase and erection of a Howell counterpoise carriage, and in 1902, $5,605.10 additional was allotted by the Secretary of War. Admiral Howell states that Mr. C. E. Cree agreed to give him a one-third interest in a central-pivot disappearing gun carriage for preparing the plans and superintending the trials. Mr. Cree was to provide all necessary means to promote the carriage before Congressional committees and the War Department and pay for patents and entirely control the business part. As far as Admiral Howell knows, only one carriage was made.

Ball-bearing trunnion.—Joseph Strauss, lieutenant-commander, U. S. Navy, received patent No. 725503 on a ball-bearing trunnion, which is used upon gun carriages by the Navy Department. The inventor states that his device has been used on 367 guns in the Navy, for which he has been paid a royalty of $10 each, making a total of $3,670 received by him; that some of the devices have been manufactured by private parties, but the majority have been constructed at navy works.

Operating gear.—W. I. Hough, master mechanic, Naval Gun Factory, received patent No. 604655 upon operating gear, which is now being used on several different calibers of guns in the Navy. The patentee states that in 1898 he assigned all his interest in this patent to James J. Sheehy, A. A. Thomas, and E. J. Turner, of Washington, D. C.; that he does not know what the assignees are doing with the patent, and refers to Mr. Sheehy for information. Mr. Sheehy was communicated with, but no reply was received from him.

Device for preventing flare-backs.—John J. Knapp, commander, U. S. Navy, and George W. Dunn, employee of the Naval Gun Factory, received patent No. 783050, and Frederick L. Sawyer, lieutenant-commander, U. S. Navy, received patent No. 782701. Both of these patents were upon a device for preventing flare-backs. Both patents were assigned to John J. Knapp, trustee. The records of the Bureau of Ordnance show that devices for clearing the bores of guns are being installed on all large caliber guns in the Navy. The right of the assignee to compensation for the use of these devices by the Government is now before the Court of Claims, case No. 28292.

This Bureau received a letter from Chief Gunner M. W. Gilmartin, U. S. Navy, in which he states that he wrote a letter to the Bureau of Ordnance on April 21, 1904, explaining how flare-backs could be prevented; that on May 26 and June 10, 1904, patents were applied for and granted to Sawyer, Knapp, and Dunn on substantially the same system suggested by him.

Smoke and gas ejector for ordnance.—Alexander Boucher, an employee of the Ordnance Department, navy-yard, Boston, Mass., is part owner with a Mr. McCloskey of patent No. 759803 upon a smoke and gas ejector, which, he states, has been tried by the Government. He has no information as to the extent of its use, and no terms of arrangement for such use have been entered into. The Bureau of Ordnance has been requested to furnish certain information regarding this patent, but no reply has been received.

Power transmitting device.—Harvey D. Williams, ordnance engineer, Navy Department, filed an application for patent, serial No. 72999, August 23, 1901; patent not yet issued. The inventor states that this device is better known as a hydraulic variable speed gear; that its purpose is the efficient transmission of power from one revolving shaft to another in a way that will permit of changing the speed and direction of rotation of the driven shaft; that the function of the device is similar to the sliding-gear transmission of automobiles for which it was primarily designed; that this gear is in use on the U. S. S. *Virgina* for elevating and depressing a 12-inch turret; it is also in use on the U. S. S. *Illinois* for training a 12-inch turret; that the Government has ordered a considerable number of gears for similar use on other ships, and these gears are being manufactured at the present time; that his interest in the American patent is wholly assigned to the Waterbury Tool Company, of Waterbury, Conn., of which he owns three-eighths of the capital stock. The records of the Bureau of Ordnance show that an experimental device covered by this patent was purchased from the Waterbury Tool Company at $2,000, and that additional orders have been placed with the same company for four gears at $1,500, and forty-three at $1,200, making a total of $59,600. Under the terms of the purchase the Bureau is

under no additional obligation for royalties, and nothing is known concerning the profit of the inventor from these sales.

Breech mechanism for ordnance.—Frank F. Fletcher, commander, U. S. Navy, received patent No. 541042 upon breech mechanism. In response to a resolution of Congress calling on the Secretary of War and the Secretary of the Navy for information as to what amounts have been paid or agreed to be paid as royalties for the use of breech mechanisms for guns manufactured under this patent, the Navy Department replied that 138 guns had been completed, and royalties had been paid to the American Ordnance Company, the owner of the patent, in the sum of $13,300, in accordance with an agreement of February 28, 1906. The agreement provided that royalties should be paid to Albert Ordway, as assignee to F. F. Fletcher. The Bureau of Ordnance states that this patent was granted to Albert Ordway as assignee of F. F. Fletcher on June 11, 1895; that Ordway transferred it to the American Ordnance Company, and the Bureau pays a royalty of $90 per gun on guns of 3 inches or under, and $100 per gun on guns over 3 inches, for the privilege of manufacturing under this patent; that 160 guns have been constructed. The Chief of Ordnance, War Department, states that a device covered by this patent was manufactured by that Department and fitted to a 3.2-inch rifle for trial, but was not adopted for use in the Army.

The records of the Patent Office show that this patent was granted to Frank F. Fletcher, assignor, to Albert Ordway, June 11, 1895; that on January 24, 1895, Fletcher transferred to Ernest Wilkinson for $1 and other considerations specified in an agreement between the parties, his entire right, title, and interest in his application; that on May 2, 1895, Ernest Wilkinson transferred to F. F. Fletcher the entire right, title, and interest in said invention; that on May 9, 1895, Fletcher transferred to Albert Ordway all his right, title, and interest in said invention, patent to be issued to said assignee; that on February 27, 1896, Albert Ordway transferred to the American Ordnance Company, of Norfolk, Va., the whole right, title, and interest in said patent; that on February 29, 1896, the American Ordnance Company granted the Bureau of Ordnance, Navy Department, a license to manufacture guns containing said patented improvements at such place or places as may be convenient, and to use and sell the same upon the terms recited, namely, $90 and $100 per gun; that on April 10, 1905, the American Ordnance Company transferred to the American and British Manufacturing Company, Bridgeport, Conn., all its right, title, and interest in said letters patent.

Breech mechanism.—Frank F. Fletcher, commander, U. S. Navy, received patent No. 499531 upon breech mechanism for breech-loading guns, about 188 of which are used by the Navy. On December 13, 1907, the Bureau of Ordnance was requested to state the terms of arrangement under which this patent is used, but no reply has been received. The records of the Patent Office show that on January 26, 1893, Fletcher granted to the Bureau of Ordnance a license to manufacture and use said improvements under said letters patent upon a consideration of $390; that on December 18, 1900, Fletcher assigned to the American Ordnance Company, Bridgeport, Conn., all his right, title, and interest in said patent.

Breech mechanism for quick-firing guns.—Frank F. Fletcher, commander, U. S. Navy, received patent No. 627913, and two de-

vices covered by this patent have been used in the Navy experimentally. The Bureau of Ordnance states that it is allowed to use this invention free of charge. The records of the Patent Office show that on December 18, 1900, Fletcher transferred to the American Ordnance Company all his right, title, and interest in said letters patent, and that on April 10, 1905, the American Ordnance Company transferred to the American and British Manufacturing Company all of its right, title, and interest in said letters-patent.

Breech mechanism for rapid-fire guns.—Frank F. Fletcher, commander, U. S. Navy, received patent No. 629673 upon breech mechanism for rapid-fire guns, and about 339 devices covered by this patent have been used by the Navy. Under date of December 13, 1907, the Bureau of Ordnance was requested to state the terms of arrangement under which this patent is used. No reply has been received. The records of the Patent Office show that on December 18, 1900, Fletcher transferred to the American Ordnance Company, Bridgeport, Conn., all his right, title, and interest in said letters-patent; that on April 10, 1905, the American Ordnance Company transferred to the American and British Manufacturing Company all its right, title, and interest in said letters patent.

Breech mechanism.—M. A. Lynch and H. Wilson, of the Naval Gun Factory, Washington, received patent No. 617110 upon breech mechanism, and the superintendent of the Naval Gun Factory states that two 6-pounder field guns have been fitted with this breech mechanism, and that there is no agreement between the Government and the inventors for the use of this patent.

Breech-loading ordnance.—R. B. Dashiell, ensign, U. S. Navy, deceased, received patent No. 818420 upon breech-loading device, and the Bureau of Ordnance stated that about 100 are used by the Navy. On November 20, 1907, that Bureau was requested to supply the data called for by Public Resolution No. 15, which request was not complied with.

Breech mechanism.—R. B. Dashiell, ensign, U. S. Navy, deceased, received patent No. 468331, which was assigned to the American Ordnance Company, March 24, 1896. The Bureau of Ordnance states that about 275 devices covered by this patent have been used in the Navy, and that royalty is being paid for the use of this patent by the Bureau of Ordnance. November 20, 1907, the Bureau was requested to state the amount of royalty which has accrued to the owners of this patent by reason of its use by the Government, which data it has failed to supply. The records of the Patent Office show that on January 2, 1892, Dashiell granted to the Bureau of Ordnance, Navy Department, a license to "manufacture guns containing said improvements at such place or places as may be convenient to the end of the term for which said letters patent were granted and to use and sell the same upon terms and conditions recited."

Breech-loading ordnance.—R. B. Dashiell, ensign, U. S. Navy, deceased, received patents Nos. 435803, 468331, 571342, and 573210 for ordnance devices. It is not known whether devices covered by these patents are used by the Government or not. The Bureau of Ordnance was requested on November 20, 1907, to supply the data called for by Public Resolution No. 15, but it has failed to comply with the request. The records of the Patent Office show that on September 15, 1890, Dashiell granted to the Bureau of Ordnance, Navy Depart-

ment, a license to manufacture four devices under patent No. 435803, and to employ them for the purpose for which they were designed upon the payment of $121. The records of the Patent Office also show that on March 24, 1896, Dashiell transferred to the American Ordnance Company, Washington, D. C., a company organized under the laws of Virginia, all his right, title, and interest in letters patent No. 468331, upon the payment of $1 and other considerations. The records of the Patent Office further show that on March 24, 1896, Dashiell transferred to the Hathaway High Explosive Company, of New York, a corporation of West Virginia, all his right, title, and interest covered by letters patent No. 571342 for $1 and other consideration. R. B. Dashiell also received patent No. 554637 for breech-loading ordnance, the entire interest in which he transferred to the Driggs Ordnance Company, in 1895, upon receipt of $1 and other consideration.

The Chief of Ordnance of the War Department states that the United States Army does not use any of the features of the patents on ordnance granted to the late R. B. Dashiell, ensign, U. S. Navy.

Breech-loading ordnance devices.—Allen W. Snyder, an employee of the Naval Gun Factory until September 3, 1907, received patent No. 319933 upon breech-loading ordnance, and he states that devices covered by his patent are used by the Government. He is not now in the service, and additional information from him can not be obtained. The superintendent of the Naval Gun Factory states that not knowing what devices are covered by the patent, it is not practical for him to state whether any of the features are used by the Government.

Firing device.—Horace W. Jones, commander, U. S. Navy, retired, received patent No. 743881 for a firing device. The inventor states that devices covered by his patent have been used by the Government experimentally only; that one device was made by the Navy Department and installed on a gun of the U. S. S. *Mayflower*, and another made by the Department of a different type was installed on a turret gun in the U. S. S. *Maine;* that both devices were removed after the completion of the experiments; that no terms of agreement were made for the use by the Government of these devices.

Firing mechanism.—Harry T. Wheeler, an employee of the breech mechanism shop, Naval Gun Factory, received patent No. 876510 upon firing mechanism, and he states that 232 devices covered by his patent have been ordered to be manufactured by the Navy Department; that about 72 of them are now in the service, and the remainder will be very shortly; that the Navy Department is now considering the terms of arrangement with him for the use of his device, it having been the understanding from the beginning that he was to be compensated for the use of his invention.

Priming device.—R. W. McNeely, lieutenant, United States Navy, received as copatentee with one J. W. Graeme, patent No. 831947, upon a priming device. On November 21, 1907, the Bureau of Ordnance was requested to furnish the data called for by public resolution No. 15, which request was not complied with.

Telescopic sights for guns, etc.—Bradley A. Fiske, captain, United States Navy, received patents No. 435925, upon device for pointing guns at sea; No. 504337, upon telescopic sight for ship's guns; No. 556048, upon telescopic sight for guns; No. 558058, upon telescopic sight (see page 37); No. 561383, upon telescopic sight.

Devices covered by these patents have been used in the Army and Navy. The Navy Department purchased from the inventor the right to use these patents for the sum of $10,000.

Telescopic ordnance sight.—H. C. Mustin, lieutenant, United States Navy, received patent No. 787855, upon a telescopic ordnance sight, which is used in the Navy. The inventor assigned a one-half interest in his patent to George N. Saegmuller. The records of the Bureau of Ordnance show that under an agreement authorized by the Secretary of the Navy the owners of the patent are to receive a royalty of $50 each on sights purchased by the Navy Department, the first or experimental one having been furnished without royalty. The Bureau purchased an experimental sight at $470 and has ordered 66 additional sights for service use at $410, royalty included, from the Bausch, Lomb, Saegmuller Company. There will be a total royalty, therefore, of $3,300.

Telescope with illuminating cross wire.—J. L. Latimer, lieutenant-commander, U. S. Navy, has a half interest in patent No. 828511. Mr. Latimer states that the owner of the other half interest in this patent is not a Government employee; that he is unable to state the extent to which devices covered by this patent have been used by the Government; that he believes there are several thousand in use; that he has never received any compensation from this patent; that he has an agreement with the owner of the other half interest of this patent that the Bureau of Ordnance is not to be charged any royalty for its use; that the Bureau of Ordnance can state the extent to which the device has been used. The Bureau of Ordnance was requested to furnish this data, but no reply has been received.

Telescopic sight.—Bradley A. Fiske, captain, United States Navy, received patent 558058 upon a telescopic sight which the inventor says has been adopted for use in the Army and manufactured and used regardless of his patent; that he has never protested, and has never received any royalty or other remuneration for such use. Captain Fiske adds that when he was content to patent things for use outside the Navy he was very successful, but his navy inventions, while advantageous to the Government, have been disadvantageous to himself.

Gun sight.—R. D. Hasbrouck, lieutenant-commander, U. S. Navy, received patent No. 834471 for a gun sight, yoke type. The inventor states that many of the features of his invention are in use by the Bureau of Ordnance. On November 14, 1907, the Bureau of Ordnance was requested to furnish the data in connection with this patent, called for by public resolution No. 15, which it has failed to do.

Milling tool.—F. E. Beatty, commander, U. S. Navy, and Fred D. Chambers, formerly a leadingman in the tool shop, Naval Gun Factory, received patent No. 691796 upon a milling tool known as a "milling machine arbor," and four of these arbors are in use by the Government. No agreement has been made between the Government and the inventors for such use.

Adjustable center.—John T. Evely, special ordnance mechanic, Naval Gun Factory, received patent No. 436223 upon an adjustable center or expanding mandrel, which is used in the shops of the Naval Gun Factory. The superintendent states that at present there are 111 on hand suitable for the different calibers of guns; that no royalty has been paid to the inventor for the use of his invention by the

Government, but that at the time of his discovery Mr. Evely was promoted from machinist to special ordnance mechanic at an increased compensation in recognition of his services in the development of this device. The patentee states that Mr. Andrew Woods, a leading man in the Naval Gun Factory at the time the patent was granted, secured his permission to make one center to demonstate its worth and usefulness in adjusting the work preparatory to machining the same; that since that time a number of centers have been made and used without his consent.

Friction hand wheel.—Joseph W. Hicks and H. D. Chapman, employees of the Naval Gun Factory, received patent No. 837835 upon sight adjustments which are used in the Naval Gun Factory. The superintendent of the Naval Gun Factory states that this hand wheel is used very extensively on sights that have been or are now being manufactured by the Government, and that no agreement has been made, so far as he is aware, between the Government and the inventors for the use of their invention. Mr. Hicks states that this wheel was first used on a 5-inch sight for the U. S. S. *Chicago* completed October 5, 1904; that all sights built thereafter were equipped with these hand wheels. It is impracticable to state the number made, as a great many were made by different firms of contractors. The superintendent further states that the inventors have made no arrangement for the use of their invention by the Government, or by contractors, but the matter was taken up at the last session of Congress by Senator Daniels, and the inventors rest their claim solely upon an adjustment with the Government.

Torpedo appliances.—J. A. Howell, rear-admiral, U. S. Navy, retired, received several patents, the first in 1871 and the last in 1886, upon torpedo and torpedo appliances, which have been used by the Government. These inventions pertained principally to the application of a fly wheel to torpedoes for directing and propelling them. The inventor states that he believes the Navy Department still uses gyroscopic steering devices; that the Supreme Court decided Howell to be the inventor, but the patent expired before he received much benefit from it; that in the Howell torpedo the heavy fly wheel propelled the torpedo and automatically steered it, and, as now used, the fly wheel automatically steers the torpedo, compressed air furnishing the motive power; that he developed this invention at his own expense and that of the promoting company; that the Department gave a little help and refused to go on; that the Hotchkiss Company spent over $400,000 in promotion with little return; that after the inventor had brought the torpedo forward enough to interest capital the Howell Torpedo Company was formed, with F. H. Paine as president; the Howell Company assigned the patents to the Hotchkiss Company, of London, and afterwards to the American Ordnance Company, of Bridgeport, Conn.; neither company ever paid the Howell Company any royalties from United States business, the expenses being larger than the receipts. The inventor, therefore, has never received any royalty or profit by reason of the use of his inventions by the Government, or from the manufacturers of articles covered by his patents for the Government. Admiral Howell concluded his statement as follows:

This inquiry should also show how the Government has been benefited without return to the inventive officer.

Torpedoes.—G. C. Davison, a lieutenant-commander in the Navy until January 1, 1908, when he resigned, received patent No. 858156 upon a heater for torpedoes, and No. 858266 upon an automobile torpedo. The records of the Patent Office show that December 27, 1906, the patentee assigned to the Navy Department the exclusive right to said inventions, and on February 16, 1907, the patentee assigned to the United States Government the exclusive right to said inventions. In both cases the Government agreed to pay the actual cost of obtaining the letters patent for said inventions. The inventor states that the automobile torpedo has been adopted for use in 250 Bliss-Leavitt torpedos now being manufactured by contract; that this improvement will probably be used in all torpedoes having a turbine motor. He further states that the superheating device is an improvement on an old device, and has been used on torpedoes already manufactured; that there have been later improvements, and his device may be regarded now as of little value; that the Navy Department reimbursed him for the expense of taking out the patents, and that he assigned the patents to the Navy Department without compensation.

Governor for water motors.—Harvey D. Williams, ordnance engineer, received patent No. 580097 upon this device, which is a speed regulator for prime motors of the turbine class. The inventor states that the peculiarity of this device is that it governs for maximum efficiency instead of for constant speed; that it has been made an important feature of a new design (not yet completed) for an 18-inch turbine-driven torpedo, on which, by order of the Secretary of the Navy, he has been working since June 1, 1907; that the torpedo is to be manufactured at the torpedo factory now being built by the Government at Newport, R. I.; that this patent, or any right under it, has not been sold or assigned.

Fuses for projectiles.—H. Wilson and A. H. Chase, employees of the Naval Gun Factory, Washington, received patent No. 760046 upon fuses for projectiles, and the superintendent of the Naval Gun Factory states that 60,000 fuses covered by this patent have been purchased by the Government; that no agreement between the Government and the inventors has been made under this patent. Mr. Chase states that he has assigned his interest in this patent to the United States Ordnance Company and that he receives one-eighth of the net profits from its use.

H. Wilson, together with M. A. Lynch, employees of the Naval Gun Factory, received patent No. 807006 upon fuses for projectiles, and the superintendent of the Naval Gun Factory states that 20,000 fuses covered by this patent have been manufactured by the Government; that no agreement between the Government and the inventors for the use of their invention has been made.

Shell.—Cleland Davis, lieutenant-commander, U. S. Navy, received a patent upon a shell, one of which was constructed and tested in 1903, but was not adopted for service use.

Shell fuse.—John L. Sticht, lieutenant-commander, U. S. Navy, received patents Nos. 797468 and 797469 upon shell fuses. He states that fuses covered by his patents were successfully tested at the Naval Proving Ground, Indian Head, Md.; that, so far as he knows, none has been otherwise used in the service.

Rod coupler for rammers and sponge handles.—A. G. Berry, captain, U. S. Navy, received a patent for a rod coupler used on sections of rammers and sponge handles. The patentee states that his invention has been used by the Ordnance Department and the entire Navy since 1888; that he has never received any royalty or compensation for its use. On November 11, 1907, the Bureau of Ordnance was requested to furnish certain data in connnection with this case, which it has failed to do.

Rammer for ordnance.—T. C. Fenton, commander, U. S. Navy, received a patent for a rammer for ordnance, No. 627404, which it is understood is used by the Government. It appears also that this officer has received patents for other devices. The Bureau of Ordnance and the patentee were both requested to supply the data called for by public resolution No. 15, but no reply has been received from either the Bureau of Ordnance or the patentee.

Process for cementing iron or steel.—Cleland Davis, lieutenant-commander, U. S. Navy, received patent No. 687612 upon a process for cementing iron or steel. The Chief of the Bureau of Ordnance states that as it does not manufacture armor it is not using this process; that he is informed that the process has been used by the Carnegie Steel Company on experimental armor plates which have been tested at the naval proving ground, Indian Head, Md.

Hard-faced armor.—A. A. Ackerman, commander, U. S. Navy, and William T. Sampson, rear-admiral, U. S. Navy, deceased, received patent No. 539010, upon a process for the manufacture of hard-faced armor. The Chief of the Bureau of Ordnance states that the patent was procured as a matter of protection to the Government; that the cost of procuring the patent, $100, was paid by the Bureau, in return for which a license was issued to the Bureau to manufacture, sell, and use armor plates constructed in accordance with said invention; that certain features on this patent have been and are now in use, as required in the manufacture of armor for the Bureau, by the various armor manufacturing companies—namely, the Carnegie Steel Company, the Bethlehem Steel Company, and the Midvale Steel Company. The records of the Patent Office show that on January 29, 1895, W. T. Sampson transferred to A. A. Ackerman the whole of his undivided one-half interest in said patent, and that on the same date A. A. Ackerman transferred to the Bureau of Ordnance, Navy Department, and all officers and employees connected therewith, the right to manufacture, sell, and use armor plates constructed in accordance with said invention in consideration of $100. As the license to the Government grants to it the right "to manufacture, sell, and use armor plates," and as the Bureau of Ordnance states that the armor constructed under this patent comes from steel companies, these companies were communicated with. The Bethlehem and Carnegie Steel companies stated that they did not employ the processes covered by this patent. The Midvale Company requested to be furnished with a copy of public resolution No. 15, and stated that they would comply with the request at a later date.

Apparatus for instructing gun layers.—R. D. White, lieutenant, U. S. Navy, received patent No. 353370, for an apparatus for instructing gun layers in aiming guns. It is understood that many devices have been constructed under this patent on board ships of the Navy and at naval stations. The Bureau of Ordnance and the patentee

were requested to supply the date called for by public resolution No. 15, which both the Bureau and the patentee have failed to do.

Intrenching tool.—G. F. Elliott, brigadier-general, U. S. Marine Corps, received a patent upon an intrenching tool about twenty-three years ago, and he states that 500 tools covered by his patent were used in the Navy, for which no royalty or other profit has accrued to him.

General Elliott recently received patent No. 856575 upon an intrenching tool of an entirely different model, which, he states, he has assigned to a business firm; that after receiving bids for intrenching tools from several manufacturers a contract was entered into to furnish 2,000 tools covered by the Elliott patent for the use of the Marine Corps; that there was reserved in the assignment of the patent the right to have the intrenching tool manufactured or sold for the use of the Marine Corps without royalty. The records of the Patent Office show that on October 29, 1906, George F. Elliott assigned to Annie M. Elliott exclusive right to said invention.

Smokeless powder (Navy).—Prof. Charles E. Munroe, John B. Bernadou, commander, U. S. Navy, and George A. Converse, rear-admiral, U. S. Navy, retired, were connected with the development of smokeless powder in the Navy. Professor Munroe received patent No. 489684 for explosive powder and process for making same; to Bernadou and Converse were granted patents Nos. 550472 upon a process of making nitrocellulose powders; 551306 upon apparatus for making explosives; to Bernadou, patents Nos. 586586 upon smokeless powder and process of same; 652455, process of making smokeless powder; 652505, smokeless powder; 673377, colloid explosive and process of making same. As it appears from the reports of the Secretary of the Navy that these patents were the results of experiments conducted by these officers at the United States torpedo station, Goat Island, Newport, R. I., a somewhat detailed investigation has been made of their development.

The development of smokeless powder in this country does not go further back than about the year 1890, and at the time of the Spanish war, in 1898, it had not come into general use in the Navy. In commenting upon the early stages of the industry, Mr. Haskell, vice-president of the E. I. du Pont de Nemours Powder Company, refers to the fact that the Government furnished the manufacturers with the formulas to work upon. In his report of 1892 the Secretary of the Navy states:

> It is a gratifying fact to be able to show that what we could not obtain through the assistance of others, we succeeded in accomplishing ourselves, and that the results are considerably in advance to those hitherto obtained in foreign countries.

The first step taken was the establishment of a laboratory at the torpedo station in 1886, which, shortly after, engaged in the testing of samples of smokeless powders which had been obtained in Europe, and in the investigation of the whole subject of smokeless powder, with the view of finding a suitable powder of this description for use in the Navy. Prof. Charles E. Munroe, who had for twelve years been professor of chemistry at the Naval Academy, and who had achieved marked distinction as an expert in explosives, was placed in charge of this particular branch of the work as the chemist of the station.

The necessity for smokeless powder had come with the improvements in firearms permitting the rapid discharge of the gun through the breech-loading device. It was found that the use of the gun was very much retarded by the smoke and gases generated in the use of the ordinary gunpowder, and in addition to this, the bore of the gun became foul after a few discharges. It is estimated that in the neighborhood of 50 per cent of the old powder was expelled from the gun in the shape of solid matter. The work undertaken at the torpedo station in this connection was to discover a powder which would be practically smokeless, and which would be entirely consumed in the course of explosion, and in addition to this give a muzzle velocity as great, and an internal pressure no greater than that of gunpowder.

Commander Goodrich was in charge of the station when this work began and he was succeeded by Commander Jewell. The work progressed under Goodrich during 1887, 1888, and 1889. In his annual report of 1890, Commander Jewell, in charge of the station, discussed the qualities sought for in smokeless powder. In his annual report of 1891, the Secretary of the Navy, Mr. Tracy, announced the invention of a smokeless powder by Prof. Charles E. Munroe, of the torpedo station, and in commenting thereon stated that the results had exceeded anticipations. He further stated that the use of ordinary gunpowder would be abandoned in calibers of 6 inches and less. In connection with this discovery there was also invented at the station, along with the other work, machines of novel design for the manufacture of smokeless powder. Commander Jewell was in charge of the station in the year 1891.

In 1892 it was announced in the official report that the smokeless powder invented at the torpedo station had withstood such favorable tests that it would soon displace other powders for all guns. In 1892 the report of the Secretary of the Navy states that—

> since the publication of the report of the Bureau of Ordnance a private firm, the du Ponts, have developed methods of modifying the characteristics of the naval smokeless powder having reference to a form of granulation which shall be capable of ready ignition and also to the ability to control the rate of burning. It is believed that these modifications solve the problem for all calibers, including small arms, for both propelling and bursting charges.

Apparently this is the first official notice of the manufacture of smokeless powder by private individuals. This report also states—

> since the last report marked progress has been made in the development of the naval smokeless powder.

In the report of 1892 the Chief of Ordnance says on this subject:

> The improvement of the methods of manufacturing and perfecting of the product have been the subjects of constant attention and study. If we have not succeeded in overcoming every difficulty that has confronted us, we are, at least, in a position to be certain of ultimate success.

He further refers to the tests for the stability of the powder:

> Portions of the substance were exposed for hours to a temperature that would have quickly caused the decomposition of that most stable explosive, gun cotton. Other and more severe tests were applied, both as to high temperature and low temperature, and the powder remained unchanged.

In his last annual message to Congress President Harrison refers to the invention of smokeless powder as one of the achievements of his Administration.

The results of the work at the torpedo station up to this point are covered by patent No. 489684, granted to Prof. Charles E. Munroe for explosive powder and process for making same, dated January 10, 1893. Professor Munroe states that at the time of taking out this patent he requested the Chief of Ordnance to secure the patent covering the discoveries which had been made at the torpedo station up to this time, in order to protect the Government in this pioneer development of the subject in America. That officer declined to take this action, whereupon Professor Munroe took out the patent himself with this end in view.

The torpedo station passed under the command of Commander George A. Converse, U. S. Navy, and upon the resignation of Professor Munroe, who had been in charge of the chemical laboratory for seven years, Lieutenant Bernadou took active charge of the experimental work. The report of the Chief of the Bureau of Ordnance for 1894 refers to tests of smokeless powder manufactured by private individuals in this country, samples having been submitted by the Leonard Smokeless Powder Company, of New York.

The next patent based upon the work at the torpedo station was No. 550472, November 26, 1895, to Bernadou and Converse for a process of making nitrocellulose powders. Under date of November 9, 1895, the records of the Patent Office show that Bernadou and Converse granted to the Bureau of Ordnance, Navy Department, the right to manufacture and use said invention to the benefit of the United States naval service at such places as it may desire upon the payment of $100 consideration. The records of the Patent Office further show that on April 12, 1899, Bernadou and Converse sold to Charles A. Rutter, Philadelphia, Pa., the "entire right, title, and interest which they jointly or solely have or may have in said letters patent throughout the United States, Territories, and dependencies thereof. Also all claims and demands for damages and profits accrued or to accrue for past or any use of said invention without right or license," $1 and other consideration. The Patent Office records also show that on October 13, 1899, Rutter sold to the International Smokeless Powder and Dynamite Company, of Philadelphia, Pa., all of his right, title, and interest in said patent.

On December 10, 1895, Bernadou and Converse received patent No. 551306 for apparatus for making explosives. The records of the Patent Office show that on November 29, 1895, the patentees granted a license to the Bureau of Ordnance of the Navy Department for the use of said patent in consideration of $100, and that on April 12, 1899, Bernadou and Converse sold their title and interest in the patent to Charles A. Rutter; that on October 13, 1899, Rutter sold the patent to the International Smokeless Powder and Dynamite Company.

On July 20, 1897, John B. Bernadou received patent No. 586586 upon a smokeless powder and process of making same. The records of the Patent Office show that on August 3, 1897, Bernadou granted a license to the Bureau of Ordnance of the Navy Department to manufacture and use said invention to the benefit of the United States naval service upon the payment of $120 within ninety days; that on April 12, 1899, Bernadou sold to Charles A. Rutter his entire right, title, and interest in said patent, and that on October 13, 1899, Rutter

sold the patent to the International Smokeless Powder and Dynamite Company, the payment being $1 and other considerations in each case.

On June 26, 1900, Bernadou received patent No. 652455 upon a process of making smokeless powder. The records of the Patent Office show that on December 22, 1902, Bernadou granted to the Bureau of Ordnance of the Navy Department a license to manufacture for the use of the United States naval service at the United States Naval Powder Works at Indian Head and at any other works that may hereafter be built by said Navy Department said invention for which said letters patent were granted.

June 26, 1900, Bernadou received patent No. 652505 for smokeless powder. A license similar to the one above is recorded.

May 7, 1901, Bernadou received patent No. 673377 for colloid explosive and process for making same. A license similar to the one above is recorded.

These patents, representing the success of the work at the Government experiment station, the licenses to the Government to manufacture thereunder in consideration of sums ranging from $1 to $120, and the sale of the title to the patents to private manufacturers are dated just on the eve of the introduction of smokeless powder into the Army and Navy and its appearance among powder manufacturers as an item of great economic value. This is shown in the report of the Secretary of the Navy for 1896, wherein he "earnestly recommends that an appropriation be made for a supply of powder to be available in emergency." He says:

> Several private firms in the United States have indicated their willingness to undertake the manufacture of smokeless powder on the specifications prepared by the Department, and contracts for this purpose will be shortly made.

In 1897 the Secretary of the Navy estimated that it would require $6,500,000 to at once refill all the vessels of the Navy with smokeless powder.

In reference to the amount of royalty or other profit accruing to the three individuals who received the patents hereinbefore described, based upon the experimental work at the torpedo station, Prof. Charles E. Munroe states that the pioneer patent taken out in his name was applied for solely for the purpose of protecting the Government in the use of the discoveries made at the experiment station, and he has never received any royalty or remuneration whatsoever other than his salary while in charge of the work.

Commander John B. Bernadou, U. S. Navy, states that he received the sum of $1 in the case of each patent from the Navy Department in payment for the assignment to the Navy Department of a license to use the patent (the records of the Patent Office show that this sum ranged from $1 to $120); that he benefited by the proceeds of the sale or assignment to a private individual of rights outside of those held by the Government; that said sales were outright and contained no stipulation for the payment of a specified sum per amount of powder manufactured; that Rear-Admiral George A. Converse, U. S. Navy, was associated with him in the development of some of the steps in the manufacture of smokeless powder, and followed his guidance in the matter of the sales of patents, receiving such share of the proceeds as Bernadou deemed him entitled to; that he has acted independently in this matter, and has no relations with other patents

or persons in connection therewith; that he was told that two other officers were urging the private sale, but he did not see what they had to do with the matter; that he was asked to give part of the proceeds from the sale of the patent to another officer, which he refused to do, as he did not see what that officer had to do with the matter; that the Navy Department has used these patents for many years, and that he has been told, and has reason to believe, that they are now being used by the War Department and have been for some time.

Rear-Admiral George A. Converse, U. S. Navy, states that the patents on smokeless powder were taken out in order to protect the interests of the Government in the processes and machinery originated and developed at the station; that, with the consent of the Navy Department and under the provision of the act of March 3, 1893, the Bureau of Ordnance took out the patents in the name of Bernadou and himself; that a free license to manufacture or have manufactured, in any private factory it might designate, all powder required for the use of the naval service was granted to the Navy Department. The act of March 3, 1893 (27 Stat. L., 731), referred to, permitted "the purchase of, or payment for, the right to use and employ such patented processes or to manufacture and use such patented devices, apparatus, models, and designs as may, in the judgment of the Secretary of the Navy, be necessary or desirable to increase the efficiency of the armor and armament for naval vessels." Rear-Admiral Converse further states as follows:

> No profits accrued to me during the time that I retained an interest in the patents. No product has been sold to the Government, or machines used in the manufacture of such product, since I disposed of my interest in the patents. To the best of my knowledge and belief, no powder manufactured under these patents has ever been furnished to the Army.

With reference to this statement, it appears from the statement of Admiral Converse's copatentee and the records of the Patent Office that the profits accruing to the patentees came from the purchase money derived from the sale to Charles A. Rutter, who transferred the patent to the International Smokeless Powder and Dynamite Company. It will be noted also that Commander Bernadou believes that powders covered by these patents have been manufactured for the Army.

With reference to the two patents to Bernadou and Converse, Nos. 550472 and 551306, the Bureau of Ordnance states that the latter was used for two years at the torpedo station and one year by the E. I. Du Pont Company. The only other patent, out of the total number granted upon smokeless powder, which the Bureau of Ordnance reports as having been used is No. 586586, to John B. Bernadou, which was used for two years at the torpedo station, and with reference to this patent the patentee states that it is the principal one of the entire list and was developed by him alone. The somewhat conflicting statements of the inventors and of the Bureau of Ordnance with relation to the extent to which the various patents have been employed might be explained by the fact that the whole subject was in the formative period of development; that the methods were being rapidly improved and new processes substituted in such a manner as to make it almost impossible to decide precisely the extent of the use of any one process. From a general study of the whole process of development, however, it seems reasonably certain that the

progress in the art and the practical employment of the various formulas are all based directly upon the experiment work done at the torpedo station, under the direction of the Navy Department.

EQUIPMENT.

Tanner sounding tubes.—Z. L. Tanner, captain, U. S. Navy, deceased, with whom was associated Commander John Blish, U. S. Navy, retired, and J. H. Benedict, of the Agricultural Department, received patents about the year 1900 upon a device for sounding the depths of the sea. The assistant in charge of the Washington office of the Coast and Geodetic Survey states that this device is economical, in that it can be used indefinitely; that it possesses great value in the work of the Survey, for which it is purchased in the open market at $2 per tube; that he considers this a reasonable price and that purchases since February 19, 1904, have aggregated 100 tubes, at a cost of $200. The records of the Bureau of Equipment, Navy Department, show that this device has been extensively used in the Navy, and is purchased in the open market.

Night signals.—Edward W. Very, superintendent of construction, Light-House Establishment, received a patent about 1874, while serving as a lieutenant in the Navy, upon a system of night signals used by the Government. He states that his bill of about $400 incurred in securing the patent was paid by the Navy Department, and in return he made a formal renouncement of all his rights thereunder; that the signals have been manufactured in this country only at the Washington Navy-Yard; that his signal is still in use in every navy of the world, and that he has received from foreign governments valuable consideration for the use of his device. The records of the Bureau of Equipment show that the Very signals, consisting of red and green stars put up in a metallic shell and fired from a No. 10-gauge pistol, are issued to the naval services; that for about five years they have been manufactured at the Naval Proving Ground, Indian Head, Md., and the pistol at the navy-yard, New York.

Day signaling system.—Bradley A. Fiske, captain, U. S. Navy, received patent No. 650830 upon day-signaling apparatus, No. 651163 upon system of day signaling, No. 716402 on day-signaling system. The patentee states that devices covered by these patents have been used in about 13 ships; that they were manufactured and sold to the Government, the inventor receiving about $2,700 in royalty from the manufacturers.

Wireless telegraphy.—W. S. Hogg, commander, U. S. Navy, received patent No. 356055 for a spark gap for wireless telegraphy, which is in use at the wireless telegraph station, navy-yard, Pensacola, Fla., of which wireless station Commander Hogg was recently in charge. No royalty or profit has accrued to Commander Hogg for installing this device at the station, and this is the only device covered by a patent granted to Commander Hogg which is used in the Navy.

Metal binnacle.—T. A. Lyons, captain, U. S. Navy, retired, invented a metal binnacle. The inventor states that subsequently he was informed by the Bureau of Navigation that Frank W. Cross, master mechanic, took out a patent upon his binnacle, and, as a result, the Government was cut off from the use of the binnacle. The Judge-

Advocate-General of the Navy states that as far as he is aware the patent obtained by F. W. Cross on a compensating binnacle did not interfere with the use of such instruments in the Navy. He refers to Paper No. 3294, 1890, on file in the office of the Judge-Advocate-General, for detailed information in relation to the Cross patent.

Binnacle.—S. W. B. Diehl, captain, U. S. Navy, and Lieutenant-Commander Gibson, are copatentees of a binnacle which is used in the Navy. Captain Diehl states that no compensation has accrued to the inventors, they having presented the patent to the Government. The Bureau of Equipment states that 223 binnacles covered by this patent, and modifications thereof, have been manufactured for the Government.

Boat-detaching apparatus.—L. J. M. Boyd, master mechanic, Naval Academy, received patent 374929 for a boat-detaching apparatus, which was tried on four vessels of the Navy, but was never officially adopted.

Boat-detaching apparatus.—Bradley A. Fiske, captain, U. S. Navy, received patents Nos. 200270 and 206100 upon a boat-detaching apparatus used in the Navy. At first the apparatus was manufactured and sold to the Navy. Not more than a dozen were so sold, and the royalty to the inventor therefor was $100. Later, after a year's tentative arrangement with the manufacturer, the inventor took the patent rights away from him and gave them to the Navy Department, which has made a great many of the devices without payment to the inventor of any royalty or other profit.

Anchor.—H. O. Dunn, commander, U. S. Navy, received patents Nos. 395429, 543129, and 810924 upon an anchor which has been used in the Navy. The inventor has received no royalty for the use of the invention, but he has a claim for royalty amounting to $4,581.24, for which the Court of Claims has entered a finding. In his claim he contends that the Government, by using Dunn anchors, effected a saving of $19,737.56. (See proceedings, United States Court of Claims, Herbert O. Dunn *v.* U. S., 1906.)

Time ball and detaching appliance.—William F. Gardner, deceased, formerly an employee of the Naval Observatory, received patent No. 334167 upon a time ball and detaching appliance, which was taken out to protect the Government in its free use. The records of the Hydrographic Office show that devices similar to the one patented by Mr. Gardner are in use at Key West and at branch hydrographic offices, but it is not clear that those in use are covered by the Gardner patent. It is understood at the Naval Observatory that the Self-Winding Clock Company, of Brooklyn, N. Y., controls patents and contracts for the installation of time balls. The clock company states that, so far as it is aware, it has no interest in any patents of a like character issued to an officer or employee of the Government.

Ship bell clock.—Henry H. Ham, machinist, navy-yard, Portsmouth, N. H., received a patent upon a ship bell clock, which is in use in the tower of the office building at the navy-yard. Mr. Ham states that at the request of the officer at the head of his department he attached his device to the clock already in the tower, furnishing all that was required in the way of a model and specifications at his own expense; that the only remuneration he ever received was thanks and glory and the only beneficiary in the transaction was the Government. His patent was sold to the E. N. Welch Manufacturing

Company, clock makers, Forestville, Conn. The manufacturers paid him a royalty from time to time, and as they sold quite a few of the clocks to the Government, exact number of which is not known, he doubtless received some royalty from that source.

Brush holders for electric motors.—Patrick O'Shaughnessy, electric machinist, navy-yard, New York, received a patent upon brush holders, two of which are used in the New York Navy-Yard, one on the elevator in building No. 10, and one on an electrical winch in building No. 114. These brush holders were furnished by the Sprague Electric Company, in 1900, before the inventor became a Government employee. The inventor has received no profits from his device, due to the failure of the Sprague Company in 1900.

Lamp holder.—John Golcher, machinist, navy-yard, League Island, received patent No. 743270 on a lamp holder, which is used by the Government. The inventor states that the extent to which his device has been used by the Government is limited to one order of 6 dozen lamp holders, which were shipped to the League Island Navy-Yard; that he manufactures the lamp holders himself and sells them to anyone desiring them; that these were furnished the Government through the Western Electric Company, which paid the inventor $1 each less 15 per cent discount, making a net price of 85 cents each.

Speed and direction indicator.—Bradley A. Fiske, captain, U. S. Navy, received patent No. 740547 upon a speed and direction indicator, which has been embodied in two instruments. One apparatus covered by this patent was made and placed on the U. S. S. *Maine* for trial. The rough usage it received was too much, and it broke down. It cost the manufacturer a few hundred dollars and the inventor paid out $125 himself, which amount he lost.

Illuminated dial pelorus.—J. M. Ellicott, lieutenant-commander, U. S. Navy, is joint patentee of an illuminated dial pelorus, the particular part of the invention discovered by Lieutenant-Commander Ellicott being a light-excluding screen. Devices covered by this patent were fitted experimentally and without charge to two instruments already purchased by the Government. The inventor knows of no purchases by the Government since the granting of this patent. He states that no royalty or other profit has accrued to him by reason of the use of the instruments by the Government, and that the patent has been assigned to the Keuffel & Esser Company.

Telescope and mount.—Bradley A. Fiske, captain, U. S. Navy, received patent No. 699300 upon a telescope and mount, which is used in the Navy. Devices covered by this patent have been embodied in two instruments, one of which was developed experimentally by the inventor at a cost of $1,500. It was sold to the Department through a manufacturer for $500, making a net loss of $1,000. A second device covered by this patent has been manufactured, but never sold.

Distance instrument.—J. M. Bowyer, captain, U. S. Navy, received patent No. 364630 upon a distance instrument. The inventor states that he sold his rights in the patent to the Lowry Manufacturing Company, of New York, about 1893. He has been informed by one who was formerly employed with the Lowry Manufacturing Company, of New York, that no instruments were sold to the Navy Department, but that one was placed on board the U. S. S. *Maine* for

test, and one was given to Commander C. H. Harlow, U. S. Navy, when he was attached to the U. S. S. *Olympia*. He believes, however, that several instruments were sold to the Revenue-Cutter Service. The records of the Revenue-Cutter Service show that 12 telemeters have been purchased from the Lowry company for the use of that Service at a cost of $40 each.

Pneumatic indicator.—G. W. Baird, rear-admiral, U. S. Navy, retired, received patent No. 342530 upon a pneumatic indicator, which has been used in at least four ships. The circumstances surrounding this case are so old that no data can be found in connection therewith, and the inventor does not recollect anything about the patent.

Range finders, etc.—Bradley A. Fiske, captain, U. S. Navy, received patents:

No. 406829 upon a range finder.
No. 406830 upon a device for finding range and position of distant objects.
No. 418510 upon a device for finding the position of distant objects.
No. 444217 upon an electrical range finder.
No. 427617 upon a method of, and apparatus for, finding the position of distant objects.
No. 483999 upon a range and position finder.
No. 510417 upon a range indicator.
No. 510418 upon a position finder.
No. 523721 upon a method of, and apparatus for, range finding.
No. 527958 upon electrical signaling system.
No. 538246 upon a range finder.
No. 538247 upon an electrical signaling system.
No. 11498 (reissued) upon an electrical signaling system.
No. 591162 upon a speed and direction indicator.

Devices covered by these patents were manufactured in considerable numbers and sold to the Army and Navy. The arrangement with the manufacturing company provided that the inventor was to receive one-fifth of the profits from the sales of the devices covered by his patents, but under this arrangement he never received any compensation, for the reason that there was no profits and the company failed.

Range finder.—Bradley A. Fiske, captain, U. S. Navy, received patent No. 661968 upon a combined range finder and turret; No. 801578 upon a range finder; No. 822201 upon a ranger finder, and another patent upon a similar device has been allowed but not yet granted. The inventor states that he has patented and developed these inventions experimentally himself at a cost up to date on two apparatus of about $4,000, exclusive of patent fees; that no particular use has yet been made of the inventions.

Device for coaling ships at sea.—Robert Potts, chief engineer, U. S. Navy, assisted the inventor of this device, Mr. Spencer Miller, in whose name the patent was taken out, and for this service he was to receive $500 for the first device installed on a Government vessel and $250 for each of the others, this agreement to continue for five years. Under this agreement Chief Engineer Potts received $750, the device having been installed on only two vessels. While the patent was not taken out in the name of Chief Engineer Potts, his services in connection with it were in the nature of those of an inventor and the compensation received by him was doubtless for services in this capacity.

HYDROGRAPHIC OFFICE.

Engraving machines.—V. L. Ourdan, formerly an employee of the Hydrographic Office of the Navy, and Charles A. Kolb, an employee of the Forestry Bureau, received jointly patent No. 435243 upon a sounding engraving machine and patent No. 435245 for a border engraving machine. Mr. Ourdan received patent No. 435244 for a compass engraving machine, patent No. 342455 for multipoint dividers, patent No. 435246 upon a border shading machine. Devices covered by these patents are in use in the Hydrographic Office of the Navy and in the Coast and Geodetic Survey. In an interview with Mr. Ourdan, March 30, 1907, he stated that his inventions were made by him on his own time and with his own material; that in two cases he associated Mr. Kolb with him for financial reasons. Mr. Ourdan has filed with the Bureau letters from officers of this Government and that of Germany and Japan, testifying of the great saving of labor in the use of his instruments. A sounding engraving machine was bought under a provision in the naval appropriation act approved July 26, 1894, which reads as follows: "To enable the Secretary of the Navy in his discretion to purchase for the United States the Ourdan and Kolb letter engraving machine and the right to manufacture and use, without payment of royalty, others of said machine and any and every improvement or modification of said machine or applicable to said machine and referred to in the letters patent that have been or may hereafter be granted to the inventors of such machine or their assignees, $20,000, or so much thereof as may be necessary."

There is no official record of the payment of this sum having been made in the Hydrographic Office, but Mr. Ourdan states that he received the full sum of $20,000 as appropriated. The purchase of a second sounding machine was approved August 16, 1900, for which the sum of $4,500 was paid out of the appropriation "Contingent and miscellaneous expenses, Hydrographic Office, 1900." The purchase of one compass engraving machine was approved July 28, 1891, and $300 was paid therefor out of the appropriation "Contingent and miscellaneous expenses, Hydrographic Office, 1901." A second compass engraving machine was purchased for $1,500 and paid for out of the appropriation "Contingent and miscellaneous expenses, Hydrographic Office, 1907." The border engraving machine was bought under approval of August 16, 1900, for $800, paid from the appropriation for "Contingent and miscellaneous expenses, Hydrographic Office, 1900." The Government pays no royalty for any of these machines, the purchases having been outright.

The Coast and Geodetic Survey, on July 6, 1900, purchased one machine for engraving soundings, one machine for engraving and lettering compasses, and one border ruling and tinting machine at a total cost of $6,000. It appears, therefore, that the total amount paid in purchases of these machines is $33,100.

Border dividing engraving machine.—R. E. Gray, of the Hydrographic Office, invented a machine for subdividing chart borders, one of which has been in use in the Hydrographic Office since 1900. The records of the office contain no information concerning the price and terms of the arrangement with the inventor for such use, but Mr. Gray is still attached to the office and states that he took out no patent for the instrument, but that his invention was sold to the Bureau by

Ernest Kubel, instrument maker, Washington, D. C., for the sum of $170. It was purchased from the appropriation "Contingent and miscellaneous expenses, Hydrographic Office." The purchase was outright, and involved no qualification regarding its use.

The Coast and Geodetic Survey purchased one of these instruments February 16, 1907, at a cost of $170.

Three-arm protractor.—E. E. Court, draftsman, Hydrographic Office, received patent No. 768426 upon a three-arm protractor. The inventor states that in 1904 there was a demand for a convenient protractor. Many were submitted to the Department, but his device was accepted and the service was supplied with his instrument. So far, the Navy Department has purchased 350 instruments, at a cost of $8 each, and the inventor estimates that some 20 or 25 will be purchased annually. The Coast and Geodetic Survey has purchased 6 and the Light-House Board 6; the Revenue-Cutter Service 1, and the War Department 2 instruments. The inventor has the instruments manufactured himself, as otherwise they would cost more than he could sell them for, and he receives a profit of $2.50 for each instrument. At the present time a total of 365 instruments have been sold to the different services, at a total cost of $2,920, on which the inventor's profit has amounted to $912.50.

Engraving machine.—G. W. Littlehales, of the Navy Department, received patent No. 561677 upon an engraving machine which has been used in the Government service. The inventor states that only one machine has been built under this patent, and this machine is used in engraving the shaded spaces on plates of Hydrographic Office charts. He has received no royalty o rother profit by reason of the use of his invention by the Government.

CONSTRUCTION AND REPAIR.

Bulkhead door mechanism.—D. W. Taylor, naval constructor, U. S. Navy, received patents Nos. 797986 and 797987 upon mechanism for operating bulkhead doors. The inventor states that he disposed of his patents soon after issue, one of the conditions of sale being that the Navy Department should be allowed to manufacture under them, if it so desired, without payment of royalty; that devices covered by his patent are in use on about 100 bulkhead doors on the United States ships *Washington*, *Kansas*, and *New Hampshire*, where they were placed by the contractors, who used the invention under the sale of the patent by the inventor.

Bulkhead doors.—F. T. Bowles, formerly a naval constructor, received patents Nos. 650973 and 651004 upon bulkhead doors, which, it is understood, are used in the Navy. The Bureau of Construction and Repair was requested to state the extent to which devices covered by the patents granted to this patentee have been used by the Government and the amount of royalty or other profit accruing to him by reason of such use. This data has not been supplied as requested.

Turning gear for electrical turrets.—A. Johan, while a gunner's mate in the Navy, received a patent upon a hand-turning gear for electrical turrets, which has been used in the Navy. The records of the Bureau of Construction and Repair show that a device covered by this patent was installed on the forward and after turrets of the U. S. S. *Kearsarge*, and was found to work satisfactorily. So far

as that Bureau is aware, no payment was made to Johan in compensation for his idea, nor has there been any subsequent agreement relative to the use of the device on other ships of the Navy, but that in consideration of Johan's services in this regard, as well as for his services in the Navy, when he was discharged from the Navy for disability he was employed as a second-class rigger at the navy-yard, New York. The inventor states that nothing by way of compensation has accrued to him for the use of his device in the Navy, except that it be the position given him by the Navy Department when discharged from the Navy for disability; that no agreement has been entered into by him with the Navy for the use of his invention.

Revolving turret mounted en barbette.—Philip Hichborn, chief constructor, U. S. Navy, retired, together with A. O. Bostrom, draftsman of the Bureau of Yards and Docks, received patent No. 711967 upon improvements in a revolving turret mounted en barbette, consisting of a main or base portion and a smaller superposed part, both being elliptical and having a sloping front and a vertical rear portion, which overhangs the barbette and serves as a counterbalance. Inventor Hichborn states that turrets of this type have been constructed for vessels of the Navy since the granting of this patent, and that he has received no royalty or profits of any description by reason of such use. The chief constructor states that there are five vessels of the Navy which have two double turrets resembling closely the turrets shown in patent No. 711967; that the Navy Department has no arrangement of any kind with Messrs. Hichborn and Bostrom in connection with this matter.

Method for constructing keels for ships.—George W. Coffin, captain, U. S. Navy, deceased, received patent No. 506139 upon a method of constructing keels for ships which has been used by the Government. The records of the Light-House Board show that this device is in use on light-house tenders *Lilac*, *Columbine*, *Magnolia*, *Ivy*, *Sumac*, *Larkspur*, and *Heather*, and on light-vessels Nos. 73, 76, 78, 79, 80, 81, and 83; that the use of this improved keel by the Light-House Board was granted by the inventor with the understanding that there was to be no charge for the use of the patent right. The records of the Bureau of Construction and Repair, Navy Department, do not show that this invention was ever used in the Navy.

Air port.—Theodore D. Wilson, naval constructor, U. S. Navy, received patent No. 222111, which has been used in the Navy. The records of the Bureau of Construction and Repair show that this patent for improvements in air ports was used in the Navy prior to October 24, 1884, and that the number of ports embodying this patent in use in the Navy up to that date was 508; that the question of compensation to the inventor arose, and under date of January 6, 1885, the board of inspection and survey reported to the Navy that it would be to the pecuniary advantage of the Government to purchase the patent rights of this invention and that the sum of $10,000 was a proper remuneration therefor. This report was approved by the Department and the purchase made by the Secretary of the Navy, the payment being made from the current appropriation for the construction and repair of vessels. The purchase included the right to use the invention on all Government vessels of every branch of the service during the life of the patent, including any improvements

that may be made therein by said Wilson, he binding himself to notify the Department thereof. The records of the Bureau of Construction and Repair do not indicate the number of air ports of this type used subsequently to October 24, 1884, but as these ports are fitted on practically all vessels of the new Navy, a very large number of them were used.

The Bureau of Construction and Repair adds in connection with this case that it has at the present time no arrangement with any Government employee by which royalty is paid for the use of any invention patented by him.

Ship's telegraphy.—R. D. White, lieutenant, U. S. Navy, received patent No. 328956, for ship's telegraphy, and it is understood that an experimental set is now in use. The Bureau of Ordnance and the patentee were requested to supply the data called for by public resolution No. 15, but no reply has been received either from that Bureau or the patentee.

Electric controlling and steering apparatus.—Bradley A. Fiske, captain, U. S. Navy, received patent No. 381228, upon a means for regulating and controlling electric motors; No. 385259, upon steering apparatus for vessels; No. 387714, upon an electric motor. Devices covered by these patents have been used in the Navy on two ships—namely, on the ammunition hoist of the U. S. S. *Atlanta*, and the gun-training device on the U. S. S. *Chicago*. The apparatus was made by private manufacturers and sold to the Government, the inventor receiving as royalty between $100 and $200.

Apparatus for tightening transmission ropes to steering engines.—John F. Hanscom, naval constructor, U. S. Navy, received patents Nos. 379461 and 796720, upon apparatus for tightening transmission ropes to steering engines which is used by the Navy Department. The records of the Bureau of Construction and Repair do not show how many vessels of the Navy have been fitted with this device, it having been installed by the vessels' builders. The Bureau has not at any time made direct purchases of any of these devices. The inventor states that the device has been used very generally on warships, where it has been placed by the builders without cost to the Government; that the invention is used chiefly by the merchant marine, and that the device consists of an appurtenance to the steering gear where it is fitted, one device to each vessel. He adds that as the profit which has accrued to him has not been at the expense of the Government, he makes no statement of the amount.

Hammock hook.—Charles McRee, draftsman, navy-yard, Boston, Mass., received a patent in June, 1893, upon a hammock hook, which is used in the Navy. The records of the Bureau of Construction and Repair show that a number of these hammock hooks have been purchased from the manufacturers, Williamson Brothers, of Philadelphia, but there is no arrangement between the inventor and the Government for such use. The inventor states that the hooks are manufactured by a Philadelphia firm; that he has never had any connection with the sale or manufacture of the same, and is unable to state the number supplied the Government. He believes, however, that approximately 5,000 hooks have been sold for the use of the Navy Department; he gives the total amount of royalties received by him upon this device, only a portion of which applied on sales to the Government.

Life buoy.—Philip Hichborn, Chief Constructor, U. S. Navy, retired, received patent No. 388971 upon what is known as the Franklin life buoy, consisting principally of a combination of torch, which lights up on striking the water, with a circular buoy. The inventor states that the Bath Iron Works, as licensee, commenced the manufacture and sale of this device October, 1892, under an agreement by which they were to pay him $50 for each buoy manufactured and sold. He gives the total number manufactured and his total royalty, but there is no data as to the quantity used by the Government. Since the expiration of the patent he has received a royalty at the rate of $25. In addition to the royalty received from the licensee, the inventor received $4,200 by judgment of the Court of Claims in compensation for the illegal manufacture of a number of buoys by the Bureau of Construction and Repair, Navy Department, during the life of the patent.

Box covers.—George H. Read, pay inspector, U. S. Navy, and Lieutenant-Commander Hitchcock, U. S. Navy, received a patent in 1883 upon box covers to be fastened without hinges, which were used on ditty boxes manufactured by the Smith-Egg Company, of Bridgeport, Conn., to whom the patent was assigned. Inspector Read states that he never heard of but one order having been given to the company, and that he received a royalty of from $200 to $300 from the manufacturers, and that Lieutenant-Commander Hitchcock received a like amount. The Paymaster-General states that prior to 1880 no ditty boxes were purchased for the Navy, each man at that time providing such article himself. In April, 1880, 3,000 ditty boxes were bought from Thomas F. Kane at $1.80 each; on March 1, 1884, 250 were purchased from the same person at the same price; on March 17, 1884, 5,000 ditty boxes were purchased from the Smith-Egg Company at $2.40. There is nothing in the specifications under which these boxes were purchased to indicate that any part of them was covered by patents. The Paymaster-General believes, however, that if the patent to Read and Hitchcock was granted prior to the purchase of these boxes from the Smith-Egg Company, they contained covers of the kind patented. In recent years, ditty boxes of a pattern not patented have been made in the various navy-yards by the Construction Department. The Chief of the Bureau of Construction and Repair states that the cover patented by Read and Hitchcock was not adopted for use in the Navy.

Red-lead injector.—Thomas M. Pearson, an employee of the navy-yard, Brooklyn, N. Y., received patent No. 791286 upon a device for injecting red lead in water-tight work. The inventor states that one pump is in continual use at the navy-yard, that has been used on the U. S. S. *Connecticut*, *Rhode Island*, *Alabama*, and *Massachusetts*, and proved very satisfactory. The inventor believes that the device should be used on all ships in commission, as they frequently spring a leak while at sea and the application of his invention to the leak would easily stop it. He offers to sell his patent outright to the Government for a reasonable price.

Sanding tool.—E. K. McCoy, boat builder, navy-yard, Norfolk, Va., received a patent upon a tool which is used in the Navy for sanding the bottoms of boats. The inventor is unable to give the extent to which his device is used, but states that he gave the Government

the right to manufacture the device for its own use exclusively in its navy-yards without royalty or compensation.

Timber-bending machine for boats.—August Stevenson, master shipwright, navy-yard, Portsmouth, N. H., received a patent upon a timber-bending machine for boats, which is used by the Government. The patentee states that he sold ten machines to the Construction and Repair Department of the Navy, two of which are in use at the Portsmouth Navy-Yard. The machines were sold on competitive bids opened at Washington, D. C., and there was no royalty or other profit from them other than the difference between the cost of manufacture and the amount received for the machines. The records of the Bureau of Construction and Repair show that the average price paid for these machines has been $2,542.86 each.

Rotary oil mixer for oil-burning purposes.—L. V. Estes, master machinist, and R. W. Wells, engine tender, who were formerly employed in the navy-yard, Mare Island, Cal., received a patent upon a rotary oil mixer for oil-burning purposes, and devices covered by this patent are used on 39 forges in the navy-yard. No royalty or other profit has accrued to the inventors by reason of the use of their invention, they having developed it at the navy-yard while employed there. The naval constructor in charge of the department in which this patent was developed states that the inventors never made any claim for remuneration, and he feels satisfied that they will not do so. Mr. Estes resigned September 23, 1907, and Mr. Wells on July 14, 1907.

Triple cam holder, punch, and bender.—Jacob L. Pearson, riveter, New York Navy-Yard, received a patent upon a triple cam holder, punch, and bender, which has been used at that yard. The inventor stated that three of these machines are now being used in the construction and repair department of the New York Navy-Yard, and that their purchase was authorized July 14, 1904, the Government paying him $90 each for them.

Punch for punching holes in copper.—Leon Ridoux, shipwright, navy-yard, New York, made application for a patent upon a punching tool for punching holes along the edges of copper sheathing. He states that a caveat was filed in connection with this application; that at least one of said tools was made in the machine shop of the New York Navy-Yard, and was used there for some time. The inventor states that he received no compensation whatever for the use of his invention, either from the Government or any other source.

Countersinking and drilling tool.—R. H. Robinson, naval constructor, U. S. Navy, made application, serial No. 188055, for a patent upon a tool for countersinking and drilling. He does not know whether the patent was issued or not. He states that a number of devices covered by his claim are in use at the navy-yards at New York and Mare Island, and perhaps elsewhere; that the right to manufacture and use this invention without payment of royalty has been reserved to the Government. All of the devices in use at New York were manufactured in that navy-yard.

Anticorrosive paint and antifouling paint.—A. P. Cuthrill, master painter, New York Navy-Yard, received patent No. 736699 upon an anticorrosive paint and No. 736698 upon an antifouling paint, both of which have been used in the Navy. The inventor states that he knows of the application of his paints to the bottoms of the U. S. S.

Texas, the collier *Cæsar*, and the torpedo boat *Ericsson;* that this paint was used by direction of the Chief of the Bureau of Construction and Repair, and that it was furnished to the Government at the same price as other similar compositions. He further states that he sold out his right in the patent, except for a small interest, a few years ago to the Dolphin Paint Company, of Norfolk, Va., a corporation organized under the Virginia laws, and that he understands that the U. S. S. *Arkansas* and the collier *Brutus* have been protected with paints covered by his patents. The records of the Bureau of Construction and Repair show that 1,833 gallons of anticorrosive paint and 991 gallons of antifouling paint, covered by the above patents, have been purchased at a total cost of $14,695.01. Outside of the small profits received on these sales the inventor has received no royalty or compensation whatever from the Government.

STEAM ENGINEERING.

Boiler.—Charles H. Manning, chief engineer, U. S. Navy, retired, received a patent upon steam boilers, and boilers covered by his patent have been used by the Government. The inventor states that two boilers covered by his patent were constructed at the Norfok Navy-Yard, and that he signed a release to the Government for any royalty before the work was undertaken; that three boilers covered by his patent were used in the Equipment Department at the navy-yard, Key West. To the best of his knowledge the inventor has never profited by the receipt of royalty from the Government for the use of his inventions. The records of the navy-yard, New York, show that 15 No. 6 Manning vertical tubular boilers of 150 horsepower each are in use; that they were bought in lots of three in the following years: Three, 1899, at $1,996.66; 3, 1900, at $1,685; 3, 1900, at $1,630; 3, 1902, at $1,950; 3, 1904, at $1,950, making a total of $27,635.66 paid for Manning boilers.

The records of the naval station, Key West, Fla., show that in the latter part of 1898 three Manning vertical tubular boilers, rated at 125 horsepower each, were received at that station from William Allen's Sons, Worcester, Mass., and that they are still in use.

Evaporator.—G. W. Baird, rear-admiral, U. S. Navy, retired, received patents Nos. 93852 and 159142 upon aerators; 233184 upon a distiller; 368642, 417802, 434972, 450361, 484946, 494658, and 532507 upon an evaporator. These devices relate to the conversion of salt water into fresh water, and have been in very general use in both the Navy and merchant marine. The inventor stated in an interview on January 11, 1908, that in most every case devices covered by his patent have been supplied to the Government through the contractors building and equipping ships for the Government; that he controlled the manufacture and sale of the articles personally in 1895, when he sold out all his patents to a manufacturer. In a few cases, where the Government has itself constructed and equipped a ship, devices covered by his patents have been constructed with his permission and without any royalty or profit to him whatever. The patentee states that he has never received a cent from the Government for any article manufactured under his patents. He further states that he has invented and placed on board ships many inventions which he did not

patent. The Bureau of Steam Engineering is unable to supply any information as to the use of these patents by the Government.

Separator for extracting water and oil from steam.—E. H. De Lany, lieutenant, U. S. Navy, received patent No. 864158 upon a separator. The patentee states that the right of free use of his invention is reserved to the Navy Department. The records of the Bureau of Steam Engineering show that one separator covered by this patent is in use on the U. S. S. *Illinois*, and that a requisition has been made for the installation of one on the distillers of the U. S. S. *Virginia*.

Improvements in ice-making machines.—William L. Bailie, passed assistant engineer, U. S. Navy, retired, jointly with W. M. Wood, lieutenant, U. S. Navy, received patents Nos. 278068 and 283054 upon a means of refrigeration needed in the special work of the Fish Commission. At the time of making this invention, these two officers were on duty on board the U. S. steamer *Fish Hawk*, in 1882. With the approval of Prof. S. F. Baird, Commissioner of Fisheries, a machine was manufactured under this patent at the Washington Navy-Yard, at the expense of the Government. About the same time a like machine was placed on board the U. S. S. *Tallapoosa*, with the sanction of the proper naval authorities, to ascertain its fitness for use in the Navy, which machine was also made in the Washington Navy-Yard at Government expense. The use of these machines was purely experimental. Ammonia was used for refrigeration, and after a trial of a few months the ammonia gas was found to be objectionable, and the machines were removed from the *Fish Hawk* and *Tallapoosa* as unsuitable for use on shipboard. It was fully understood by the inventors that the Government was to have the free use of the patents and they were taken out to protect the Government.

Steam trap.—J. W. Lytton, engine tender, navy-yard, Norfolk, Va., received a patent upon a steam trap which has been used by the Government. The inventor states that the patent was placed in the hands of John D. Moore, 45 Liberty street, New York, in February, 1906, to be marketed by him; that 30 steam traps have been sold to the Navy Department, but that instead of there being any profit there has been an actual loss of several hundred dollars, due to the fact that the traps have cost more to produce than the Navy paid for them: that a board of naval officers in February, 1905, reported favorably upon the use of this steam trap, and in the requisitions the Lytton trap is specified by name. The head of the steam engineering department of the Norfolk Navy-Yard states that this trap is the lightest and most efficient one ever used by his department and is specified for this reason.

Steam trap.—Robert D. Kinney, draftsman, office of the inspector for the United States Navy, New York Ship Building Company, Camden, N. J., received patent No. 989157 upon steam traps which have been used by the Government. The inventor states that 26 traps covered by his patent were installed on board the U. S. S. *St. Louis*, and that no arrangement for such use has been made with him. The traps were built by the receivers of the Neafie & Levy Ship and Engine Building Company, builders of the *St. Louis*, under an arrangement between himself and said company by which he received $100 and the patterns.

Combination valves.—A. B. Willits, commander, U. S. Navy, received patent No. 798551 for an improvement in combination valve. The inventor states that 16 devices covered by this patent are in use on the U. S. S. *St. Louis* as boiler stop valves; that no terms of arrangement have been made with the Government, and that the Government is legally free to make and use such valves. No question of cost to the Government was involved in the use of these valves on the *St. Louis*, as their installation was adopted by the contractors as a satisfactory one to meet the specification and was approved by the Bureau prior to the taking out of the patent thereon.

Extensible piston ring.—Otto Johnson, warrant machinist, U. S. Navy, received a patent upon an extensible piston ring. One of the devices covered by this patent was fitted to the main engine cylinders of the U. S. S. *Kearsarge*. No compensation was received therefor by the inventor, his sole purpose being to make the machinery of that ship, of which he was an officer, more efficient. So far as the inventor knows the device has not been used anywhere else by the Government.

Boiler-tube stopper.—William Little, commander, U. S. Navy, received patent No. 458304 upon a boiler-tube stopper, and he also purchased the rights under patent No. 172528 upon a similar invention granted to Peter Walker, of Jersey City. The inventor states that he has never made any claim for the use of his patent by the Navy, but he believes that in equity, estimating the royalty at $1 on each stopper made and supplied to vessels in the Navy, there is due him $8,000 or $10,000; that every ship with fire-tube boilers used stoppers covered by patent No. 172528, and continues to use them; that the precise number of ships using boiler-tube stoppers can be determined from the records of the Bureau of Steam Engineering; that to the best of his belief no other boiler-tube stoppers than those covered by his patents have been used since 1885 in the ships of the Navy; that each ship was supplied with from 20 to 40 stoppers, which were manufactured in navy-yards; that he never made a claim for the use of his patents by the Navy, and never received an offer therefor or relinquished his patent rights.

Telescopic smoke pipe.—W. Dungan, chief engineer, U. S. Navy, received a patent upon a telescopic smoke pipe, the right to use which he granted to the Government. Chief Engineer Dungan is now dead, and the Navy Department is unable to state the extent this patent has been used by the Government or the exact terms of the arrangement with the inventor for such use.

Bench vise.—Mr. H. C. Rasner, an employee of the Mare Island Navy-Yard, received a patent upon a bench vise, and one vise covered by this patent has been used in the steam engineering pattern shop of that yard. The commandant of the yard states that Mr. Rasner furnished one of these bench vises for the steam engineering pattern shop without cost to the Government and used it himself, but that the vise is not now in use, as better vises than the one invented by Mr. Rasner have been purchased.

Metallic packing.—W. B. Brooks, chief engineer, U. S. Navy, retired, is the owner of a two-thirds interest in a patent metallic packing granted to John Wesley Hayes, patent No. 387591. Mr. Brooks states that this packing is in use on a stationary engine in the navy-yard, Portsmouth, N. H., and also in the U. S. S. *Galena*

and several of the United States transport ships, and at the navy-yard, Kittery, Me., and that no royalty was expected or paid; that at the time of the granting of the patent John Wesley Hayes was employed at the navy-yard, Portsmouth, N. H.

MISCELLANEOUS.

Indicator for pneumatic-tube carriers.—J. A. Mudd, pay inspector, U. S. Navy, received a patent upon an indicator for pneumatic-tube carriers which was used at the New York Navy-Yard before it was patented. The Bureau of Ordnance states that this use was without profit to Mr. Mudd or cost to the Government. The inventor sold all his rights in the patent to the Lamson Company, of Boston, for $1,200, and has had no interest of any kind in the patent since its sale.

Indicators.—H. Wilson, an employee of the Naval Gun Factory, has received patent No. 853612 upon indicators, and the superintendent of the Naval Gun Factory states that 49 indicators covered by this patent have been manufactured by the Government. No agreement between the Government and the inventor has been made for the use of his invention.

Lever and ratch attachment.—Harvey D. Williams, ordnance engineer, Navy Department, received patent No. 613950 upon a lever and ratch attachment, being a portable hand tool known to the machinist's trade as a universal ratchet drill—that is, a ratchet drill which is operated where, owing to close quarters or obstruction, an ordinary drill can not be used. The patentee states that there is one of these tools in the steam engineering equipment of each ship in the Navy; that the patent is owned by the Armstrong Brothers Company, of Chicago, and he believes them to be the sole manufacturers; that he sold all of his interest in the invention in 1898, some months before the patent was issued, and about a year before he became a Government employee.

Ruling pen.—John R. Gisburne, an employee of the Bureau of Ordnance, Navy Department, received a patent upon a ruling pen, which has been used by the Government. He states that approximately 170 gross of pens covered by his patent have been disposed of to the various Executive Departments through dealers in Washington, D. C. He also gives the total amount of sales to the dealers of Washington, D. C., and the total amount of profits to him on such sales, but there is no means of ascertaining the exact amount of profit which has accrued to him by reason of sales only to the Government.

Parallel rule.—Charles D. Sigsbee, rear-admiral, U. S. Navy, retired, received patent No. 224962 for a parallel rule. The patentee has had no interest in the patent since its sale to John Bliss & Co. in 1887. Rules covered by this patent have been used by the Government, but nothing definite is known in connection therewith.

Tobin bronze.—John A. Tobin, passed assistant engineer, U. S. Navy, retired, registered in the United States Patent Office the trade-mark "Tobin bronze," and also the name of "Tobin," and transferred his interests therein to a manufacturer, about the year 1890. He has received a royalty on the trade-mark "Tobin bronze," which relates to a metal, and which has always been regarded by the Government and commercial interests as a proprietary article. Mr.

Tobin's interest in the trade-mark consists in an agreement on the part of the manufacturer to pay him a royalty for the use of the name "Tobin" in connection with said trade-mark on the total poundage manufactured and sold. He states that it is impossible to distinguish to what extent the Government has used the metal, or the amount of royalty accrued by reason of such use, as no record exists of amount of metal sold to the Government, some having been sold direct and some through jobbers.

Mr. Tobin has also received a patent upon compound armor plate, and he states that material manufactured under this patent was shipped at his expense to the proving ground at Annapolis for test by the Government. He also received a patent upon a composition of metals, which he transferred to the manufacturers using the trade-mark "Tobin bronze" about the year 1890.

Handle for pocket knives.—Bradley A. Fiske, captain, U. S. Navy, received patent No. 255847, and devices covered by this patent were made by a manufacturer and sold to the Navy in small numbers. The inventor states that he does not know the exact amount so sold; that he never received any royalty or other remuneration, but, on the contrary, lost about $100 on the patent on account of the expense of obtaining the patent and making models.

Swivel for jackknives.—T. J. Cowie, pay inspector, U. S. Navy, received a patent on an improvement in sailors' jackknives, consisting of a brass swivel, to which the lanyard is attached. The inventor states that after his patent had been issued a smooth brass wire was placed through the hole in the butt of the knife, and he understands it has been required by the Department ever since. The Paymaster-General states that he believes that the particular swivel used is not covered by letters patent. Pay Inspector Cowie has derived no benefit from his patent.

Shield for padlocks.—John Jarvis, coxswain, Naval Academy, is the joint owner, with Nevette Steele, pay clerk, U. S. Navy, of patent No. 676001, on an improved shield for padlocks which is in use on the mail boxes in the Naval Academy grounds. The shields have never been placed on the market and are used nowhere else except at the Naval Academy, where they were installed by Coxswain Jarvis for his own convenience as mail carrier, and without expense to the Government.

Snap hook.—Albert Moritz, commander, U. S. Navy, retired, received patent No. 596215 upon a snap hook, and a few articles covered by this patent are used by the Navy Department. The inventor states that the Griscom-Spencer Company has exclusive right to manufacture and sell this device; that before the Griscom-Spencer Company obtained the exclusive right to manufacture in 1903, the M. T. Davidson Company, of Brooklyn, N. Y., manufactured the hook. Under date November 30, 1907, the Davidson Company states "it is impossible for us to go over our books for the last ten years, as some of them have been destroyed, in order to give you the information asked for. We feel safe in saying, however, that the number of hooks should not exceed 200." The inventor further states that he never received any royalty on the sale of the 200 hooks, but that on March 23, 1905, he received $36.20 as royalty from the Griscom-Spencer Company, which amount represents a gross sale of $362.

The inventor does not know whether any of this amount came from sales to the Government.

Universal joints.—Walter S. Turpin, lieutenant, U. S. Navy, and J. H. Holden, lieutenant, U. S. Navy, are copatentees of patent No. 840529, on an improvement on universal joints. Mr. Turpin states that negotiations are now pending for the use of this device by the Navy Department; that the final arrangements have not been completed, but so far as they have gone the Navy Department has been granted a license to manufacture, for which it is to pay a royalty varying in amount, depending on the size of the joint; that he is unable to state the extent to which this device has been used, but that he has been informed unofficially that a considerable number have been manufactured at the navy-yard, Washington, D. C.; that the arrangements for the use of this patent were all made by Mr. Holden, to whom he refers for further information. Mr. Holden was communicated with, but as he is attached to the U. S. S. *Missouri*, one of the ships in the squadron en route to the Pacific, no reply has been received.

MEDICINE AND SURGERY.

Splint stretcher.—Charles F. Stokes, surgeon, U. S. Navy, received a patent upon a metallic litter and splint which has been adopted for use in the Army and Navy upon the recommendation of a joint board of medical officers of the Army and Navy. (See General Orders, No. 84, 1906.) The Surgeon-General of the Army states that three of these stretchers were purchased by the Medical Department in September, 1904, for trial at the Manassas maneuvers; that the stretcher was also recommended for adoption by the Army for use on transports, hospital ships, and batteries at seacoast stations, but no purchases have been made under this authority.

The Bureau of Medicine and Surgery, Navy Department, states that the Stokes splint stretcher has not been included in the supply table of the Medical Department, nor have purchases of this stretcher been made by the Medical Department, the understanding being that the Bureau of Construction and Repair has been negotiating with the manufacturers of the stretcher. The Bureau of Construction and Repair states that a requisition was approved February 13, 1907, for 100 Stokes splint stretchers to be purchased in the open market through the navy pay office; that upon delivery at the New York Navy-Yard, it is proposed to issue two of these stretchers to each battle ship and cruiser of the first and second class, and one to each gunboat and coast-defense vessel as requested by the Bureau of Medicine and Surgery, May 5, 1906. Surgeon Stokes states that in perfecting the stretcher he was put to both expense and trouble, but that he has not received, and never expects to receive, any royalty for the use of his stretcher in the Army and Navy.

Board transportation.—D. H. Mahan, captain, U. S. Navy, received patent No. 677673 on what is known as the Mahan board or litter. The inventor states that the board is used in the Government service. The Chief of the Bureau of Medicine and Surgery states that the Bureau has been using for a number of years a board transportation manufactured under the direction of the Bureau at the naval medical supply depot, Brooklyn, N. Y., but he is not aware that it is the same device upon which Captain Mahan has received a patent. No

agreement has been made with Captain Mahan for the use of his invention and no claim of infringement has ever been made.

YARDS AND DOCKS.

Improvements in dry docks.—M. J. Endicott, civil engineer, U. S. Navy, received patent No. 470750 upon improvements in dry docks which were used in the construction of the dry dock at the United States navy-yard, Puget Sound, Wash. The inventor made no charge to the Government for such use.

Caisson gate for dry dock.—George F. Schild, naval architect, Mare Island, Cal., received patent No. 287178 upon a caisson gate which has been used in the dry dock at that yard. Senate report No. 1293 on Senate bill 3946, Fifty-sixth Congress, first session, states that when the dry dock was about completed at Mare Island and a caisson gate was needed Mr. Schild's gate was adopted and manufactured by the Union Iron Works at a cost of $60,000. Considerable litigation has resulted in connection with this use of the Schild design. The case went finally to the United States Supreme Court (Belknap *v.* Schild, 161 U. S., 10). In the course of the litigation it was found in the United States circuit court that there had been a saving to the Government of $40,000 by reason of the use of the Schild design. The result of the litigation, however, left the inventor without remedy, and an effort was made to give him relief by Senate bill 3946, Fifty-sixth Congress, first session, which was favorably reported. The history of the case is given fully in the Senate report above referred to.

INTERIOR DEPARTMENT.

Process for photographing opaque objects.—Prof. H. S. Williams, while in the employ of Yale University, took out a patent on a process for preparing and photographing opaque objects, which is used in the work of the Geological Survey. Inasmuch as Professor Williams, who is now at Cornell University, is employed from time to time by the Geological Survey, his case has been investigated.

On October 5, 1901, prior to the adoption of his process by the Survey, he sold and assigned to the Scientific Photograph Company, of New York, all of his rights under the patent. R. H. Williams states in a letter of April 30, 1902, to the Secretary of the Interior, that he is now the sole owner and exploiter of this patented process; that the company is not a corporation, but merely a name adopted by him for business convenience, and that he is in no way connected with the Government service. It appears from this letter that the patented process is used in the Washington Academy of Sciences and the geological departments of Yale, Johns Hopkins, and Columbia universities; that it was demonstrated in a test made by the Geological Survey that there was a saving of 50 cents per figure by the use of this process, and in addition to this saving the illustrations so made are more accurate. The Director of the Survey made a proposition to the owner of the patent by which the Government is to pay a royalty of 30 cents for every figure developed by the process during the life of the patent and improvements thereon. This proposition was accepted by the owner in his letter of August 29, 1901. Under the terms of this contract the disbursing officer of the Survey stated in

an interview on September 17, 1907, that the total amount paid under the terms of said contract was approximately $1,500.

Attachment to surveying instrument.—Whit Beaman, an employee of the Geological Survey, is the patentee of an attachment to surveying instruments used in the Geological Survey; patent No. 816422. There are at present about thirty of these attachments in use in the Survey, and Mr. Beaman has waived his royalty rights to the Survey, thereby enabling it to purchase the attachment at a lower price than that for which it is listed. He has received no profit whatever from the use of the invention by the Geological Survey.

Process of photolithographically transferring designs to plates.—Ernest H. Daniel, an employee of the Geological Survey up to November, 1898, received a patent, No. 648854, May 1, 1900, upon a process for obtaining on copper plates a reproduction of the original drawing. The process was called phototracing and was later improved and used in the Geological Survey. Mr. Daniel received no compensation for the use of his process while he remained an employee.

S. J. Kubel, chief engraver, Geological Survey, received a one-eighth interest in the Daniel process. Subsequently, a stock company was formed—the Daniel Process Company—for the exploitation of the process, and Mr. Kubel transferred his one-eighth interest for a cash consideration and some stock in the company. The process was leased to the Survey, which used it for four years, and under the contract the company received July 1, 1903, $5,000; July 1, 1904, $5,000; July 1, 1905, $5,000; July 1, 1906, $4,000—a total of $19,000. Mr. Kubel stated in an interview on September 20, 1907, that he recalled no dividend as ever having been paid to him by reason of the use of this process; that on September 5, 1903, he transferred all of his shares of stock (297) to the company. The use of the process by the Survey was discontinued July, 1906, when a process worked out in the Bureau, and which costs the Bureau nothing, was adopted. Mr. Kubel stated that a conservative estimate made by the Bureau showed that the saving by use of the Daniel process amounted to $11,500 a year, and that in addition, the accuracy obtained by the process was something which could not be estimated in money value. The records of the Hydrographic Office of the Navy show that during the years 1899 and 1900, at the invitation of the Daniel Process Company, there were made, without cost, certain photo-transfers by the Daniel process, for the purpose of enabling the Hydrographic Office to test the capabilities of the process and estimate its availability for the improvement of chart engraving; that these demonstrations of the Daniel method of transferring designs to plates were quite satisfactory, and an estimate from the Daniel Process Company on the work of the Hydrographic Office was requested. As no statement was received from the company, no further steps were ever taken in the matter.

Plane-table tripod head.—W. D. Johnston, an employee of the Geological Survey, invented a plane-table tripod head, which is used to considerable extent in the Survey. Mr. S. A. Aplin, head of the instrument division of the Survey, stated in an interview September 17, 1907, that in all purchases involving the Johnston patent the Survey received the benefit of the royalty to Mr. Johnston. The price of the instrument was $45, and the price to the Survey $35,

being the net price less the royalty of $10 to the inventor. There were some 300 instruments in all purchased under this arrangement.

Remington type cleaner.—C. H. Reese, of the Interior Department, is the inventor of a type cleaner, which was used in several of the Departments about 1903. Mr. Reese stated that he manufactured the article himself and sold it to a typewriter supply company. The invention did not prove to be a success, and he lost between $800 and $1,000 in exploiting it.

Combination eraser.—Miss E. M. Wilson, of the General Land Office, in 1903, took out a patent upon a combination eraser, which was used for a while in the Interior Department. She stated in an interview that the article was not properly manufactured and proved defective, and therefore ceased to be used in the Department. The erasers were purchased through the stationery dealers of this city, and the inventor made little or no money from her patent.

Cutlery cleaner.—William T. Queen, an employee of the Government Hospital for the Insane, received patent No. 726100 upon a cutlery cleaner. Two of these articles are in use at the hospital, only one of which has been purchased by the institution. Mr. Queen received $10 for the machine and $8.25 for fixtures for the same. He receives no royalty for its use.

Fastening for elevator doors.—Richard H. Gay, an employee in the heating and ventilating department of the United States Senate, has received patent No. 851086 upon an elevator fastening which has been installed in the Senate wing of the Capitol. The devices were made in Government time and out of Government material, and no compensation has been paid to the inventor for the use of the device and none has been asked for or expected by the inventor so far as the Capitol building is concerned. The inventor states he has not sold to the Government or installed for the Government elsewhere the device referred to.

DEPARTMENT OF AGRICULTURE.

Apparatus for determining water in butter.—C. E. Gray, an employee of the Bureau of Animal Industry, received patent No. 343281 upon this apparatus, which is largely used by the Department in its laboratories, and is also extensively used in the commercial world. Mr. Gray has assigned the use of his patent to the Government and has received no remuneration from the Government for such use.

Serum for prevention and treatment of hog cholera.—Marion Dorset, Bureau of Animal Industry, received a patent upon this serum, which is now in the experimental stage. Mr. Dorset took out the patent to protect the Government in the use of his invention and has assigned it to the Government. He has received no profit whatever from the use of his invention.

Method of extracting potash from feldspathic rocks.—A. S. Cushman, Office of Public Roads, received patent No. 851922 upon this process, and his patent is assigned to the Government.

Naturalist's camera.—G. M. Collins, of the Department of Agriculture, received a patent about five years ago upon a naturalist's camera. About six cameras involving this patent are in use by the Department of Agriculture, by means of which photographs of the exact size of the object can be taken. These photographs appear in

the publications of the Department. The inventor has received no compensation for the use of his invention by the Government.

Sampling machine.—C. C. Moore, of the Department of Agriculture, received a patent about 1896 upon a sampling machine, one of which was constructed by the Department and is used for the purpose of taking a fair average sample of earth or any other material. It is used in the Department chiefly for taking samples of soils. The inventor has received no royalty or other profit by reason of the use of his invention by the Government.

Apparatus for determining the moisture in grain.—Edgar Brown and J. W. T. Duvel, of the Bureau of Plant Industry, received patent 848616 upon an apparatus for determining the moisture in grain. A number of machines covered by this patent are in use in the grain and testing laboratories of the Department, and they are also in commercial use by seedsmen and in grain elevators. The inventors have received no royalty or other profit by reason of the use of their invention by the Government.

Hand blotter.—W. A. Murray received a patent about 1903 upon a hand blotter, which is manufactured by the A. A. Weeks Company, 11 Gold street, New York, from whom Mr. Murray receives a royalty. As the blotter is in very general use, only a small proportion of the royalty is derived from sales to the Government.

Seed-packet filler.—J. E. W. Tracy, Bureau of Plant Industry, received a patent upon a device for filling seed packets. The Solicitor of the Department of Agriculture states that the Tracy patent was taken out under the provisions of the act of March 3, 1883, which provides that the patent shall be for the free use of any person. The inventor states that the use of his machine makes it possible for the Government to secure competitive bids for putting up seeds; that the inventors and owners of the only other practicable machine state that it is worth $1.32 per thousand packets to do this work; that their last bid was for $1.21½, which is about 3 cents higher than is now being paid to the contractor using the Tracy machine. The inventor believes that if it were not for the competition resulting from his machine the owners of the other machine would charge $1.32 or even more. As approximately 37,000,000 packets are used annually, the Tracy patent secures a saving of about $3,700 a year to the Government. The contractor is using 22 of these machines, on which he has paid no compensation of any sort to the inventor, although he has also disposed of several of the machines to other parties.

Nitro-culture germs.—George T. Moore, a former employee of the Bureau of Plant Industry, received patent No. 755519 upon the cultivation of bacteria in nitrogen-free solution, and the distribution of cultures in dry form. The patent was granted particularly upon the second item. The provisions of the act of March 3, 1883, applied to the granting of this patent dedicating its free use to the Government and the people of the United States. Under this patent the methods became free property, and quite a number of commercial concerns started to make cultures for distribution. One of these companies, the National Nitro-Culture Company, of West Chester, Pa., sought the services of Doctor Moore as an expert, and offered him a salary very much larger than that being paid him by the Government. He was attracted by the offer, and considered it pending a decision on the

part of the Government officials as to whether his salary in the Department could be increased. The Department states that a certain lack of frankness in connection with the negotiations while this matter was pending caused his removal from the service July 28, 1905. The Department is not now using the dry-culture method of distribution, but is distributing in nitrogen-free liquid media, a method which has always been used to a greater or less extent by the Department.

Loose-leaf files.—John J. Duffy, of the Forestry Service, received a patent upon a loose-leaf binder filing device, which has been used in the Treasury Department. The inventor states that he sold his interests in the patent to the Chicago Binder and File Company; that filing devices covered by his patent have been purchased for use in the Treasury Department, but that the parties furnishing it are not the ones to whom he sold his patent; that the transferees of his patent have entered suit against the manufacturers selling the device to the Government for infringement of the Duffy patent. Mr. Duffy makes a signed statement that he has received no profit or royalty by reason of the use of his device by the Government. The records of the Treasury Department show that F. Sharp & Sons were awarded the contract for furnishing 7,200 binders in 1905 at a cost of $9,900; that in addition to this the same firm has furnished 321 binders of various kinds at an aggregate cost of $718.19 during the last three years. In each case the binders were purchased through the Public Printer on requisition, and the cost includes the 10 per cent additional charged by that official.

Labels for inspected meats.—Daniel E. Salmon, formerly of the Bureau of Animal Industry, was engaged in the printing business with George E. Howard in a copartnership under the name of George E. Howard & Co. This business agreement existed while Mr. Salmon was holding his position in the Department. During the existence of this business arrangement, George E. Howard personally was employed from time to time by the Agricultural Department as an illustrator of poultry, etc., and he subsequently invented a label for inspected meats, which was adopted for use by the Department and of which large purchases were made. It appears from an investigation made by the solicitor of that Department that Mr. Salmon disclaimed all interest in the patent, and that Mr. Howard stated that he was the sole inventor of the label so adopted; that about the time of the adoption of the label by the Government the copartnership arrangement between Howard and Salmon was brought to an end. This matter of the patented label was but one of a number of subjects covered by the investigation, and apparently had but little to do with the results reached in that case; but it was thought best to make this much of a report thereon.

Wireless telegraph.—R. A. Fessenden, late of the Weather Bureau, received patents Nos. 727331 (12115 reissue), 731029 (12168 reissue), 12169 (reissue), and 753863 upon methods and apparatus for wireless telegraphy. The work of Mr. Fessenden on the subject of wireless telegraphy was conducted under a provision in a contract entered into with him by the Secretary of Agriculture January 9, 1900. Under this contract Professor Fessenden was to receive a salary of $3,000 a year and was to be assisted by a person of his own selection at a salary of $1,200 per year; the Government was to purchase such apparatus and supplies as might be considered necessary by the Chief of the

Weather Bureau, said property to belong to the Weather Bureau. There was also to be detailed for one year two employees of the Weather Bureau to assist in the experiments without cost to Fessenden. In consideration of the foregoing, whatever inventions were made by Fessenden or had been made by him applying to the wireless transmission of electric signals were to be immediately patented by him at his expense and the right to use said inventions given to the Weather Bureau for the transmission over land and sea of official messages without charge except for the apparatus at the actual cost of manufacture. The Weather Bureau was also empowered to manufacture the apparatus for its own use. Fessenden reserved all commercial rights and privileges accruing from said inventions.

In pursuance of the foregoing contract on March 6, 1902, and on June 2, 1904, R. A. Fessenden executed licenses to the Weather Bureau to manufacture and use the inventions described in the letters patent, the numbers of which are given above. It will be noted that the license from Fessenden is limited to the Weather Bureau, and in view of the transfer by Executive order of the subject of wireless telegraphy to the Navy Department the Chief of the Weather Bureau states that no practical use of any of the Fessenden patents was ever made by the Bureau. The records of the Patent Office show that under the contract with Mr. Fessenden the Weather Bureau is entitled to use inventions embraced in 12 patents.

The inventor states:

(*a*) That the system was not invented by him while in the employ of the Weather Bureau, but several years prior thereto.

(*b*) That the attention of the Weather Bureau was attracted to his system by his articles and scientific publications describing the working of the system.

(*c*) That the Weather Bureau assured itself before signing the contract that the system had been developed to a point of practical operation and that patent applications protecting the system had already been filed in the Patent Office.

(*d*) That one of the inducements held out by the Weather Bureau to induce him to sign the contract was the statement that he would stand a better chance of selling his apparatus to the Army and Navy if it were already adopted by the United States Weather Bureau.

(*e*) That the object of the Weather Bureau contract was not the development of his system, since that had already been developed, and was in use, but was merely the adaptation of the system to Weather Bureau uses, as distinct from commercial telegraphy.

It appears from a communication from the inventor that his system of wireless telegraphy is now used by the Army and Navy, where it is believed to possess advantages over the coherer or Marconi system, and that his inventions constitute a system entirely distinct from that of Marconi; that the Weather Bureau besought his cooperation, appealing to him upon the ground that it was a public duty; that the nature of his work for the Government was the adaptation of his system to the uses of the Government, it requiring more technical skill than possessed by the Weather Bureau operator; that his contract went no further than to permit the Weather Bureau alone to have the right to use the system, and this only "for the purpose of transmitting meteorological information."

The inventor received a letter signed by Cleveland Abbe, on behalf of Prof. Willis L. Moore, Chief of the Weather Bureau, dated December 21, 1889, in which the right of the Weather Bureau to use the Fessenden patents is limited to meteorological purposes. Notwithstanding this limitation the inventor states that the Government has

seized the property of the inventor to the value of at least $2,500,000, and is using it at the present time in some 250 Government stations; that although he has offered to fix a price for the use of his inventions by the Navy and Army by arbitration, his offer has never been accepted, and neither he nor his associates have received one cent in return for their work or investment, and a great wrong has been done them in this respect.

Wireless device.—Louis Dorman, weather observer, Elkins, W. Va., received patent No. 742298 upon a device which has been used in an experimental way in the transmission of test messages in wireless telegraphy by the weather bureau at Manteo, Roanoke Island, North Carolina, and between Point Reyes and the Southeast Farralon Islands, California. Under date of January 16, 1904, the inventor executed an agreement with the Department of Agriculture for the use of his patent by said Department.

Cold-storage process.—Orin Parker, assistant observer, weather bureau, Bentonville, Ark., received a patent upon a process for the preservation of perishable articles by surrounding them with air that had been dried by reducing the temperature below the freezing point. The temperatures selected for drying and preserving were 12° and 33° F. above zero. The inventor states that the use of his process became general, and he never made any serious effort to control it. The use of the process by the Government is only such as has become general everywhere.

Air-cooling device.—Willis Moore, Chief of the Weather Service, is the patentee of an air-cooling device, one or two of which are in use in the Philippines. He has assigned the right to use this device to the Government and has received no royalty or other profit on account of its use.

Means for stencil printing.—Henry L. Heiskell, of the Weather Bureau, is copatentee with T. W. Smith in a means for stencil printing, patent No. 443801. The inventor states that this invention was designed to take the place of a machine in use by the Bureau and for which it paid $45 or $85 per machine, according to size; that the result of the invention of these employees was a reduction in the price of the machine to $5 and $10; that the saving to the Government in the first year was about $10,000, as reported by Generl Greely, Chief of the Weather Service; that he has received a total of $60 profit from the patent, and has not been connected with it for fourteen years; that he was offered and refused $5,000 for the patent in 1890 by the company which had been supplying the Bureau. The machine is not much used at the present time. In all about 500 machines have been purchased by the Weather Bureau, 10 by the Bureau of the Census, and 5 by the Quartermaster's Department.

DEPARTMENT OF COMMERCE AND LABOR.

Electrical measuring instrument.—E. B. Rosa, physicist, in the Bureau of Standards, invented an electrical measuring instrument upon which he obtained a patent several years prior to entering the service. One of such instruments is in use in the Bureau of Standards, and by means of it calculations and measurements are made which were impossible before the adoption of the instrument and which no other known instrument would accomplish. Mr. Rosa stated to a repre-

sentative of the Bureau in an interview on September 10, 1907, that at the time of the purchase of this instrument by the Government he arranged that upon this particular sale he would receive no compensation in any form whatsoever, and by reason of this arrangement the Government actually obtained this instrument at a less cost than anyone else could have done, namely, $200.

Maxima and minima tide-predicting machine.—William Ferrel, an employee of the Coast and Geodetic Survey at the time he invented this machine, never took out a patent thereon, and it does not come within the terms of the resolution, but the nature of the case is such that a brief statement of the facts is submitted.

The theory and plan of this machine were first submitted to the Superintendent of the Coast and Geodetic Survey in the spring of 1880. It received favorable consideration and the construction of the machine upon the plans submitted was at once decided upon. It was constructed by Fauth & Co., of Washington, under the supervision of G. N. Saegmuller, of the Coast and Geodetic Survey. In a letter to the Bureau the Superintendent of the Coast and Geodetic Survey states that the original cost of this machine was about $3,500; that William Ferrel freely gave his invention to the Government, without any attempt to secure personal advantage to himself; that "the preparation of the predicted tides for our tide tables has been made, almost exclusively, by the Ferrel tide-predicting machine every year from 1883 to the present time, a period of about twenty-four years. It is operated by a single computer who by its aid is enabled to make all the predictions required for our annual tide tables.

"It would require at least 30 additional computers to do this work analytically, if they were to take account of all the 19 elements that the machine does, and it is very desirable that these elements should be introduced into the computation. On this basis we would have an annual saving by the use of the machine of 30 computers at $1,000 each for the past twenty-four years, or a total of $720,000." The Superintendent states, however, that it would not have been the policy of the Survey to have expended such a sum of money, but that it would have adopted computations involving less elements than are taken care of by the machine, the result of which would, of course, be a less accurate service to the public. He further states that prior to this invention the predictions of the Survey were restricted to the ports of the United States, but for the past twelve years many foreign ports have been included. This additional service would have required about three more computers at $1,000 each during the past twelve years, and therefore there has been a saving in this service of $36,000, with decidedly better and more accurate predictions than could have been otherwise made. This sum added to the amount named above makes a total of $756,000, which the work done by this machine would have cost the Government.

The Fowler-Hoover paper process.—Edwin H. Fowler and Dickerson N. Hoover, employees of the Coast and Geodetic Survey, took out patent No. 748179 upon a process for treating paper with a solution of glycerin and alcohol for the purpose of making it nonexpansible and nonshrinkable. It was the intention to use such paper for the charts in the coast survey work, wherein the delicate measurements engraved upon the charts are affected by the least change in the dimensions of the paper by reason of expansion or contrac-

tion. In an interview with the assistant in charge of the office, on September 13, 1907, it was stated that the process had not accomplished all that was hoped for on account of the great absorptive properties of paper so treated, and that its use was confined to the office copies of charts, not over two reams a year being used. In an interview with Mr. Hoover, the only surviving patentee, he stated that the paper was now in commercial use; that his interest and the Fowler interests had been assigned to a third person as trustee, with the agreement that no charge whatever should be made to the Coast and Geodetic Survey for the use of the process. Mr. Hoover further stated that all the paper used in the Coast and Geodetic Survey to which the patented process was applied was treated by himself at the Survey and no revenue whatever had ever come to him by reason of the sale to the Government of paper treated with his process. A limited quantity of paper treated with this process is used in the Hydrographic Office of the Navy Department and is furnished by the Coast and Geodetic Survey through courtesy. An attempt was made to have paper treated with this process adopted by the Bureau of Engraving and Printing, but after experimental tests it was decided not to use it.

Fog-signal boiler.—George Warrington, at present an employee of the Light-House Board, is the inventor of a fog-signal boiler used on light-vessels Nos. 59, 60, 61, and 62. These boilers were purchased in the year 1893, and none has been purchased since. Mr. Warrington did not become an employee of the Government until the year 1904, over ten years after the purchase of his patented boilers. Whatever profit may have come to him was included in the original price of these four boilers. He stated in an interview on September 16, 1907, that the whole amount of profit derived by him from this invention has not been sufficient to reimburse him for the outlay to which he has been put in connection therewith. The object of the invention is to raise steam in the smallest amount of time, and he states that in the official tests of his patent made by the Light-House Board only six minutes and ten seconds were consumed between the lighting of the match and the blowing of the fog signal. His invention would have proved invaluable to the service down to the present time had it not been for the development of the oil engine. About the time of his invention the oil engine came into use, and by means of it the compression of air for use in fog horns is instantaneous. For these reasons he thinks that the Light-House Service will have no further use for his invention, but the four boilers above referred to are still rendering satisfactory service.

Bell-ringing machine.—W. R. Livermore, colonel, U. S. Army, retired, received a patent upon a bell-ringing machine, which was used by the Light-House Establishment in tests made in Boston Harbor some ten years ago. The inventor authorized its use by the Government without compensation. It appears from the records of the Light-House Board that the device is not in use.

Pasting apparatus.—Robert A. Pelham, an employee of the Bureau of the Census, took out a patent December 19, 1905, upon a pasting apparatus which is in use in the Census Office. This machine consists of a device for applying an adhesive to strips of paper, which are to be transferred to a book or sheet and build up tabulated matter, and has for its object the expediting of the work of coating these

strips with adhesive, and the economic use of the adhesive. Mr. Pelham has received royalties from the Bureau to the amount of $326, the unit price of royalty being $10 per month per machine. There are two in use, which were constructed by the inventor and cost the Government nothing.

Tabulating devices.—Mr. Herman Hollerith was employed in the Tenth Census, and may have conceived the ideas embodied in his inventions during the time of his employment by the Government. He subsequently perfected his inventions, and they were used on a large scale in the Twelfth Census, but Mr. Hollerith was not employed in that census by the Government. The act of March 3, 1899, authorizing the Twelfth Census provides in section 26 "that in case the Director of the Census deems it expedient, he may contract for the use of electrical or mechanical devices for tabulating purposes, provided that in such case due notice shall be given to the public and no system of tabulation shall be adopted until after a proper test of its merits in competition with other systems which may be offered."

Under this authority, the Director of the Census adopted the Hollerith machines, and there were paid for the use of said machines the following amounts:

Rental.

Hand tabulating machines, at $1,000 per annum	$197,543.31
Hand tabulating machines, at $1,500 per annum	149,421.40
Hand tabulating machines, at $3.50 per diem	3,929.39
Automatic tabulating machines, at $0.50 per 1,000 cards tabulated	31,984.94
Automatic tabulating machines, at $0.65 per 1,000 cards tabulated	38,327.34
Automatic sorting machines, at $0.13 per 1,00 0cards sorted	285.42
Automatic sorting machines, at $0.18 per 1,000 cards sorted	8,492.88
	419,984.68

Purchase.

20 automatic sorting machines	9,200.68
295 keyboard punching machines, at $30 each	8,850.00
(50 additional of these machines were supplied without charge.)	
683 celluloid key plates for the above, at $2.50 each	1,707.50
501 celluloid key plates, at $5 each	2,505.00
600 Hollerith patent standard keyboard punching machines at $20 each	12,000.00
2 gang punches at $50 each	100.00
2 side gang punches	513.62
	34,876.80

In a recent interview with the chief clerk of the Bureau of the Census a representative of the Bureau was informed that the Hollerith machines were no longer used in the work of the Bureau of the Census.

SMITHSONIAN INSTITUTION.

Fish-hatching apparatus.—This apparatus is the invention of Marshall McDonald and Steven C. Brown, employees of the Smithsonian Institution at the time the invention was made. Patent No. 263933, September 5, 1882. The apparatus is in extensive use at the stations of the Fish Commission, but the patent expired in 1897. The only compensation which has been paid to the inventors for the use of their invention is the sum of $2,500, divided equally between them, being

a specific appropriation made by Congress for this purpose. The invention has been in extensive use by the Bureau of Fisheries throughout all these years and is in use at the present time, and it is stated at the Commission that it has been of invaluable service to the Government in fish-culture work.

GOVERNMENT PRINTING OFFICE.

Cutting-down machine.—Michael Shaen, acting foreman of the foundry, jointly with an employee named Alexander Elliott, now deceased, invented a machine for planing electrotype plates and molds, designed to shave true the blank wax cases used in electrotyping precedent to the molding of objects in said cases. Patent No. 718245, January 13, 1903. Mr. Shaen stated that the patentees disposed of their ownership in the patent two or three years after the date of the patent. The first machine used in the Government Printing Office was constructed in the machine shop of the office, and John J. Dohoney, now a machinist in said shop, was one of the workmen who constructed it. Mr. Shaen stated to a representative of this Bureau, September 19, 1907, that he had derived no profit whatever from the use of the machine by the Government; that the invention was made outside of Government time. The office now operates a second machine, which has some improvements over the first machine and which was constructed by manufacturers at a cost of about $300. Prior to the adoption of this invention work was done by hand, requiring from three to five minutes, which is now done by the machine in less than one minute, both operations requiring the attention of one man.

Improved rollers.—J. H. Hennessey, foreman of the roller room, has made a number of improvements in rollers for printing presses, the principal ones of which are a sectional roller and a spiral roller. The former is a device for saving ink and the latter a device for controlling the ink supply, giving a lighter distribution of ink when desired without touching the founts. These improvements are just at the stage of perfection and applications for patents upon them are pending. Mr. Hennessey stated in an interview September 19, 1907, that he was confident of the great advantages derived from the use of these rollers and that he anticipated in the near future seeing them extensively adopted in the Government Printing Office. He has made no arrangement for their use by the Government, but thinks it will depend entirely upon their demonstrated ability to do the work in a more satisfactory and economic manner than anything else known in the art. Up to the present time Mr. Hennessey has received no profit whatever from the use of his inventions by the Government.

Envelope sealer.—Joseph T. Wilkinson has been employed as a counter in the Government Printing Office since 1900. Prior to that time he invented certain improvements to a machine owned by the Automatic Envelope Sealer Company, patent No. 674050, May 14, 1901. These improvements were sold to the company outright. The machines were installed in the Washington city post-office, Post-Office Department, Pension Office, Treasury Department, Census Office, and in certain pension agencies. Mr. Wilkinson stated in an interview on September 19, 1907, that the company had a capital of

$10,000, but that through poor management the concern is now defunct and he doubts whether the machines in the offices above referred to are all in operation, for the reason that there is no one to repair them when out of order, now that the company has given up the business. For some time after he was employed at the Government Printing Office he was on night work and during the day visited the machines, keeping them in repair, but he has not done this for some time past. He thinks that he is the only person who ever derived any profit from the machine, and this was prior to his entering the service, by sale of his patents to the company. The stockholders, some of whom were employees of the Government, lost what they put into it.

Blowpipe.—Elmer Johnson, an employee in the foundry, Government Printing Office, is the patentee of a blowpipe, which is used in a very minor way in the Government Printing Office. Patent 731910, June 23, 1903. Mr. Johnson stated in an interview on September 19, 1907, that only two pipes were in use in the office—one of them by himself and another one by a coemployee; that these two blowpipes were not the property of the Government, but were his own, and that no profit whatever had come to him from such use. The object of the patent is to economize in the use of gas and at the same time have better control over the flame.

Sponge cup for money counters.—Katie L. Groggan, an employee in the Government Printing Office, has an interest by inheritance in a sponge cup for money counters, which is used to a limited extent in the Treasury Department. Patent No. 412604, October 8, 1889. This invention was made by her husband, Henry Groggan, deceased, while employed as an expert counter in the cash room of the Treasury Department. The sponge cup was sold for 25 cents, but few of them were ever disposed of to the Government.

Appliance for packing coins.—Patent No. 188599, March 30, 1877, Katie L. Groggan. The facts stated in connection with the sponge cup for money counters apply also in this case.

Elevating table for sewing benches.—James W. Hughes, chief machinist, is the joint patentee with M. T. Lincoln, deceased, who was also an employee, of an elevating table for sewing benches, which is used in the Government Printing Office. The patent was granted October 30, 1866, and has now expired. Mr. Hughes states that they received a small royalty on the first tables introduced in the office many years ago, but he does not recollect the amount.

Mailing attachment for books.—William F. Mahoney, in the purchasing division of the Government Printing Office, is the patentee of a device for the protection of the edges of books when placed in the mail—Patent No. 658666, September 25, 1900. The device was used in the Bureau of Ethnology, Government Printing Office, Indian Office, and the United States Senate. Mr. Mahoney, in an interview September 19, 1907, stated that the invention was made while he was an employee of the Government, and that it has been sold to the Government at a rate of $2.60 per thousand. The price was placed so low that, upon paying the manufacturer's bills, he found little profit left in the business. He estimates that the total amount of profit to himself through the sale of this article to the Government

would not exceed the sum of $150, which would not pay him for the time devoted to the invention. None of the articles has been sold to the Government for about two years.

Flue cleaner, scraper, and wiper.—A. T. Stewart, of the Government Printing Office, is the inventor of a combination flue cleaner, scraper, and wiper, upon which he has applied for a patent. He states that there are three in use in the Government Printing Office, which he built at home, and for which he received $28.

Printers' furniture.—Richard B. Topham received patent No. 110695, on printers' furniture, which is used at the Government Printing Office. Shortly after receiving the patent he sold it to his brother. The records of the Government Printing Office show that approximately 7,000 sidesticks covered by the Topham patent are in use. The last lot, 1,000, was purchased at a price of 23 cents each. The previous prices ranged from 25 to 35 cents, the price having been greatly reduced as the necessity arose for larger amounts.

INDEX.

	Page.
Ackerman, A. A., commander, U. S. Navy	40
Adjustable center	37
Air-cooling device	68
Air port	52
Allen, James, brigadier-general, U. S. Army	26
Ammunition cart	16
Ammunition hoist	29
Ammunition hoists and conveyors	29
Anchor	47
Andrus, B. L., superintendent of mail-lock repair shop	30
Anticorrosive paint and antifouling paint	55
Aparejos, steel ribbing for	23
Apparatus for determining water in butter	64
Apparatus for instructing gun layers	40
Apparatus for tightening transmission ropes to steering engines	53
Armor, hard faced	40
Asbestos shield for stovepipes	23
Attachment to surveying instrument	63
Bailie, William L., passed assistant engineer, retired	57
Baird, G. W., rear-admiral, U. S. Navy, retired	49, 56
Ball-bearing trunnion	32
Batson, M. A., captain, U. S. Army, retired	29
Bayonet	15
Beach, Charles E., Bureau of Engraving and Printing	10
Beaman, Whit, employee of the Geological Survey	63
Bear-trap weir	27
Beatty, F. E., commander, U. S. Navy	37
Belding, George L., manager, cadet laundry, West Point	21
Bell-ringing machine	70
Belt plate	17
Belts, woven cartridge	17
Bench vise	58
Berry, A. G., captain, U. S. Navy	40
Billings, L. G., pay director, U. S. Navy	21
Binnacle	47
Binnacle, metal	46
Bits and bridles	20
Blank cartridges	16
Blowpipe	73
Board transportation	61
Boat-detaching apparatus	47
Boiler	56
Boiler-tube stopper	58
Border dividing machine	50
Boss, Charles F., supply division, Post-Office Department	30
Bostrom, A. O., draftsman, Bureau of Yards and Docks	52
Both, A. C., assistant engineer, U. S. Engineer's Office	26
Bottles, improvement in	21
Boucher, Alexander	33
Bowles, F. T., formerly a naval constructor	51
Bowyer, J. M., captain, U. S. Navy	48
Box covers	54
Box for packing campaign hats	24
Boyd, L. J. M., master mechanic, Naval Academy	47

Page.
Brass grommet for mail bags 30
Breech-loading ordnance 13, 35, 36
Breech mechanism 14, 34, 35
Brooks, W. B., chief engineer, U. S. Navy, retired 58
Brown, Edgar, Bureau of Plant Industry 65
Brown segmental wire gun 13
Brown, Steven C., Smithsonian Institution 71
Browne, W. C., major-general, U. S. Army 23
Brush holders for electric motors 48
Buffington, Gen. A. R., U. S. Army 14
Bulkhead door 51
Bulkhead doors and mechanism 51
Burns, William W., major, U. S. Army 22
Burpee, George H., of the Supervising Architect's Office 11
Buzzicott, Francis H., private, U. S. Army 21
Camera, naturalist's 64
Campaign hats, box for packing 24
Can-opener scissors 20
Carborundum wireless receiver 25
Cartridge, blank 16
Cartridge machines and clips 16
Cartridge packing case 16
Casting guns and cooling them from the inside, method for 14
Cementing iron or steel, process for 40
Chambers, Fred D., formerly a leadingman in the Naval Gun Factory 37
Chapman, H. D., employee Naval Gun Factory 38
Chase, A. H., employee Naval Gun Factory 39
Clock, ship bell 47
Coaling ships at sea, device for 49
Cold-storage process 68
Coffin, George W., captain, U. S. Army, deceased 52
Coin sacks, seal for 11
Coins, appliance for packing 73
Collins, G. M., Department of Agriculture 64
Combination valves 58
Combined breakwater and paved beach 26
Commercial system of cipher 26
Compensator for controlling speed 28
Concrete mixer 28
Concrete piles, process of making 11
Counterpoise carriage 32
Countersinking and drilling tool 55
Court, E. E., draftsman, Hydrographic Office 51
Cowie, T. J., pay inspector, U. S. Navy 60
Crozier, William, brigadier-general, U. S. Army 12, 14
Cushman, A. S., office of public roads 64
Cut-off for firearms 55
Cuthrill, A. P 64
Cutlery cleaner 72
Cutting-down machine 12
Dalton, George T., sr., Treasury Department 23, 24
Daly, H. W., chief packer, Quartermaster's Department, Fort Leavenworth, Kans 63
Daniel, Ernest H., employee of the Geological Survey 35
Dashiell, R. B., ensign, U. S. Navy, deceased 39, 40
Davis, Cleland, lieutenant-commander, U. S. Navy 39
Davison, G. C., lieutenant-commander, U. S. Navy 46
Day signaling system 57
De Lany, E. H., lieutenant, U. S. Navy 19
Depression position finder 19
Depression range and position finder 49
Device for coaling ships at sea 33
Device for preventing flarebacks 47
Device for teaching the correct sighting of firearms 48
Diehl, S. W. B., captain, U. S. Navy 48
Distance instrument

Page.
Dorman, Louis, weather observer, Elkins, W. Va---- 68
Dorset, Marion, Bureau of Animal Industry---- 64
Driggs, William H., commander, U. S. Navy, retired---- 31
Drill, ratchet---- 59
Dry dock, caisson gate for---- 62
Dry docks, improvement in---- 62
Duffy, John J., Forest Service---- 66
Dungan, W., chief engineer, U. S. Navy---- 58
Dunn, B. W., major, U. S. Army---- 15
Dunn, George W., employee of Naval Gun Factory---- 33
Dunn, H. O., commander, U. S. Navy---- 47
Dunwoody, H. H. C., brigadier-general, U. S. Army, retired---- 25
Dupau, Josiah, Treasury Department---- 11
Duplicating process---- 11
Duvel, J. W. T., Bureau of Plant Industry---- 65
Electric controlling and steering apparatus---- 53
Electrical measuring instrument---- 68
Electro-chronographs---- 19
Electro-magnetic waves, method for sending---- 25
Elevating table for sewing benches---- 73
Elevator doors, fastening for---- 64
Ellicott, J. M., lieutenant-commander, U. S. Navy---- 48
Elliott, G. F., brigadier-general, U. S. Marine Corps---- 41
Emergency food---- 21
Endicott, M. J., civil engineer, U. S. Navy---- 62
Engraving machine---- 50
Envelope sealer---- 72
Eraser, combination---- 64
Estes, L. V., master machinist---- 55
Evaporator---- 56
Evely, John T., special ordnance mechanic, Naval Gun Factory---- 37
Extracting potash from feldspathic rocks, method for---- 64
Extractor, foot valve---- 25
Fenton, T. C., commander, U. S. Navy---- 40
Ferrell, William, employee of Coast and Geodetic Survey---- 69
Fessenden, R. A., late of Weather Bureau---- 66
Field ranges or ovens---- 21
Finley, John P., captain, U. S. Army---- 26
Firing device---- 36
Firing mechanism---- 36
Fish-hatching apparatus---- 71
Fiske, Bradley A., captain, U. S. Navy---- 36, 37, 46, 47, 48, 49, 53, 60
Fitting for pipe railing---- 26
Flare backs, device for preventing---- 33
Fletcher, Frank F., commander, U. S. Navy---- 31, 34, 35
Flue cleaner, scraper, and wiper---- 74
Fog-signal boiler---- 70
Foot valve extractor---- 25
Form base---- 10
Fowler, Edwin H., employee Coast and Geodetic Survey---- 69
Franklin, Thomas, captain, U. S. Army---- 21
Friction hand wheel---- 38
Fuller, Lawson M., major, U. S. Army---- 16
Fuses for projectiles---- 39
Fuse, shell---- 39
Gardner, William F., deceased, formerly of Naval Observatory---- 47
Gay, Richard H., employee of United States Senate---- 64
Gerdom, Gregory, ordnance machinist, Sandy Hook Proving Grounds---- 13
Germs, nitro culture---- 65
Gibson, Lieutenant-Commander---- 47
Gillespie, G. L., major-general, U. S. Army, retired---- 30
Gilmartin, M. W., chief gunner, U. S. Navy---- 33
Gisburne, John R., employee Bureau of Ordnance, Navy Department---- 59
Golcher, John, machinist, navy-yard, League Island---- 48
Gordon, W. B., lieutenant-colonel, U. S. Army---- 13
Governor for water motors---- 39

Page.
Grading hose, screw anchor for 27
Grain, apparatus for determining moisture in 65
Gray, C. E., Bureau of Animal Industry 64
Gray, R. E., employee of Hydrographic Office, Navy Department 50
Greeley, A. W., major-general, U. S. Army 26
Groggan, Katie L., employee in Government Printing Office 73
Grommet, brass for mail bags 30
Gun mounting 14
Gun sight 37
Gun-sling attachment 19
Hains, Peter C., jr., U. S. engineer's office, Baltimore, Md 28
Ham, Henry H., machinist, navy-yard 47
Hammock hook 53
Hand blotter 65
Hanscom, John F., naval constructor, U. S. Navy 53
Hard-faced armor 40
Harley, Joseph L 10
Hasbrouck, R. D., lieutenant-commander, U. S. Navy 37
Hearn, C. C., captain, U. S. Army 19
Heiskell, Henry L., Weather Bureau 68
Hennessey, J. H., roller room 72
Hichborn, Philip, chief constructor, U. S. Navy, retired 52, 54
Hicks, Joseph W., employee Naval Gun Factory 38
Hitchcock, lieutenant-commander, U. S. Navy 54
Hodges, H. F., lieutenant-colonel, U. S. Army 29
Hog cholera, serum for prevention and treatment 64
Hogg, W. S., commander, U. S. Navy 46
Hoisting machinery 29
Holden, J. H., lieutenant, U. S. Navy 61
Hollerith, Herman 71
Hoover, Dickerson N., employee Coast and Geodetic Survey 69
Hospital tent 23
Hough, W. I., master mechanic, Naval Gun Factory 33
Howell, J. A., rear-admiral, U. S. Navy 32, 38
Hughes, D. E., assistant engineer, U. S. engineer's office, Los Angeles, Cal 29
Hughes, James W., chief machinist in Government Printing Office 73
Hurter for chanoine wicket 27
Hydraulic dredging machine 28
Ice-making machines, improvements in 57
Illuminated dial pelorus 48
Improved rollers 72
Improved tent 23
Indicator, speed and direction 48
Indicators 59
Indicator for penumatic tube carriers 59
Injector, red lead 54
Inspected meats, labels for 66
Intrenching tool 41
Jackknives, swivel for 60
Jarvis, John, coxswain, Naval Academy 60
Johan, A., formerly a gunner's mate in the Navy 51
Johnson, A. F., architectural draftsman, custom-house, New York 12
Johnson, Elmer, employee in the foundry, Government Printing Office 73
Johnson, Otto, warrant machinist, U. S. Navy 58
Johnston, W. D., employee of Geological Survey 63
Jones, H. W., commander, U. S. Navy, retired 36
Jones, W. A., brigadier-general, U. S. Army, retired 27
Jumping bar 30
Keels for ships, method for constructing 52
Kingman, D. C., lieutenant-colonel, U. S. Army 28
Kinney, Robert D., draftsman, office of naval inspector, Camden, N. J 57
Knapp, John J., commander, U. S. Navy 33
Kolb, Charles A., Forest Service 50
Labels for inspected meats 66
Lamp holder 48
Lang, Frank A., assistant superintendent of public buildings, New York City 12

Page.
Latimer, J. L., lieutenant-commander, U. S. Navy 37
Le Blanc, Alexis, electrical engineer, United States Engineer's office, New York City 28
Letter-box fastener 30
Lewis, I. N., major, U. S. Army 19
Lever and ratchet attachment 59
Life buoy 54
Lincoln, M. T., Government Printing Office 73
Lissak, O. M., major-general, U. S. Army 16, 30
Little, William, commander, U. S. Navy 58
Littlehales, G. W., Navy Department 51
Livermore, W. R., colonel, U. S. Army, retired 16, 70
Loading tray for breech-loading ordnance 15
Loose-leaf binder 12, 66
Lynch, M. A., Naval Gun Factory 35
Lyon, W. C., Supervising Architect's Office 11
Lyons, T. A., captain, U. S. Navy, retired 46
Lytton, J. W., engine tender, navy-yard, Norfolk, Va 57
McBlair, C. R., Supervising Architect's Office 16
McCoy, E. K., boat builder, navy-yard, Norfolk, Va 54
McDerby, G., lieutenant-colonel, U. S. Army, retired 27
McDonald, Marshall, Smithsonian Institution 71
McNeely, R. W., lieutenant, U. S. Navy 36
McRee, Charles, draftsman, navy-yard, Boston, Mass 53
Magazine firearm 14, 15
Mahan, D. H., captain, U. S. Navy 61
Mahoney, William F., purchasing division, Government Printing Office 73
Mailing attachment for books 73
Manning, Charles H., chief engineer, U. S. Navy, retired 56
Manning, W. C., major, U. S. Army, deceased 16
Marshall, W. L., colonel, U. S. Army 26
Medal of honor 30
Merriam, H. C., major-general, U. S. Army, retired 18
Metal binnacle 46
Metal, packing, all- 28
Metallic packing 58
Metcalfe, Henry, captain, U. S. Army, retired 18
Milling tool 37
Mills, Anson, brigadier-general, U. S. Army, retired 17, 20
Moisture in grain, apparatus for determining 65
Moore, C. C., Department of Agriculture 65
Moore, George T., formerly an employee in the Bureau of Plant Industry 65
Moore, Willis, Chief of the Weather Service 68
Moritz, Albert, commander, U. S. Navy, retired 60
Motor carriage, spring return 13
Mounting for rapid-fire guns 31
Movable dam 26
Mudd, J. A., pay inspector, U. S. Navy 59
Munson, E. L., surgeon, U. S. Army 21, 23
Murray, W. A 65
Mustin, H. C., lieutenant, U. S. Navy 37
Naturalist's camera 64
Neck yoke counter stock 19
Night signals 46
Nitro culture germs 65
Nolan, F. T., steam engineer, United States engineer's office, Jacksonville, Fla 28
Numbering machine 11
Opaque objects, process for photographing 62
Operating gear 33
Optical telegraph, Finley 26
Ordnance 31
O'Shaughnessy, Patrick, electrical machinist, New York Navy-Yard 48
Ourdan engraving machines 50
Pack equipment 23

	Page.
Pack, Merriam	18
Packing, all-metal	28
Packing case, cartridge	16
Packing coins, appliances for	73
Padlocks, shields for	60
Paint, anticorrosive and antifouling	55
Paper process, Fowler-Hoover	69
Parallel rule	59
Parker, Orin, assistant observer, Weather Bureau, Bentonville, Ark	68
Parker, William M., captain, U. S. Army	
Pasting apparatus	70
Patterson, E. O., master of dredge, engineer's office, New Orleans	27
Pearson, Jacob L., deceased, riveter, New York Navy-Yard	55
Pearson, Thomas M., employee of New York Navy-Yard	54
Peeling machine, vegetable	21
Pelham, Robert A., employee in Bureau of Census	70
Photographic device	21
Photographing opaque objects, process for	62
Photolithographically transferring designs to plates	63
Pipe railing, fitting for	26
Piston ring, extensible	58
Plane-table tripod head	63
Pneumatic drills	
Pneumatic indicator	49
Pneumatic tube carriers, indicator for	59
Pocketknives, handle for	60
Porter, C. F., chief clerk United States engineer's office, Portland, Oreg	26
Porter, Thomas I., secret service division, Chicago, Ill	11
Potts, Robert, chief engineer, U. S. Navy	49
Powder, smokeless	17, 41
Powell, Leighton, lieutenant, U. S. Army	19
Power steering gear	27
Power transmitting device	33
Pratt, Sedgewick, brigadier-general, U. S. Army, retired	19
Press register	10
Priming device	36
Printer's furniture	74
Pritchett, William H., Bureau of Engraving and Printing	11
Projectiles, fuses for	39
Pullman, John W., colonel, U. S. Army	23
Punch for punching holes in copper	55
Queen, William T., employee of Government Hospital for Insane	64
Rafferty, W. C., major, U. S. Army	19
Rail screw	11
Rammer	40
Range finder	19, 49
Rapid-firing gun	31
Rapid-firing gun, mounting for	31
Rasner, H. C., employee of the Mare Island Navy-Yard	58
Ratchet drill	59
Raymond, R. R., captain, U. S. Army	29
Read, George H., pay inspector, U. S. Navy	54
Receiver, carborundum wireless	25
Red lead injector	54
Reese, C. H., Interior Department	64
Reflector for inspecting guns	19
Reissmann, Frederick, post quartermaster-sergeant, West Point	25
Remington type cleaner	64
Reversible folding sash window	12
Revolving door	12
Revolving turret mounted en barbette	52
Rice, Edmund, brigadier-general, U. S. Army, deceased	15, 22
Ridoux, Leon, shipwright, navy-yard, New York	55
Robert, Henry M., brigadier-general, U. S. Army, retired	28
Robinson, R. H., naval constructor, U. S. Navy	55
Rock drills	27
Rod coupler for rammers and sponge handles	40

Page.
Rodman, Thomas B., brigadier-general, U. S. Army 14
Roller, improved 72
Roller track 28
Rosa, E. B., physicist in Bureau of Standards 68
Rotary oil mixer for oil-burning purposes 55
Rule gauge 25
Ruling pen 59
Russel, E., major, U. S. Army, retired 21, 26
Russell, A. H., colonel, U. S. Army 14, 15, 19
Ryan, John J., blacksmith, United States engineer's office 27
Sackett, J. W., chief assistant engineer, United States engineer's office, Jacksonville, Fla 28
Saddle 20
Salmon, Daniel, Bureau of Animal Industry 66
Sampling machine 65
Sampson, William T., rear-admiral, U. S. Navy, deceased 40
Sanding tool 54
Sand-paper holder 25
Sash window, reversible folding 12
Sawyer, Frederick L 33
Schild, George F., naval architect, Mare Island, Cal 62
Schroeder, Seaton, captain, U. S. Navy 31
Schulz, E. H., captain, U. S. Army 30
Screw anchor for grading hose 27
Sealer, envelope 72
Sealing machine 11
Searchlight projectors, platform for 30
Seed-packet filler 65
Separator for extracting water and oil from steam 57
Serum for prevention and treatment of hog cholera 64
Shaen, Michael 72
Shell 39
Shell fuse 39
Shelter tents 22
Shelter tent and clothing roll combined 22
Shield for stovepipe, asbestos 23
Ship bell clock 47
Shrapnel 15
Sibley, H. H 22
Sievert, H. A., captain, U. S. Army 20
Sights for guns, etc., telescopic 36, 37
Signaling, Day system 46
Sigsbee, Charles D., rear-admiral, U. S. Navy, retired 59
Sketching case 29
Smith, James D., Bureau of Engraving and Printing 11
Smith, T. W 68
Smoke and gas ejector for ordnance 33
Smoke consumer 11
Smokeless powder 17, 41
Smoke pipe, telescopic 58
Snap hook 60
Snyder, Allen W., formerly an employee in Naval Gun Factory 36
Sounding tubes 46
Speed and direction indicator 48
Speed gear, variable
Splint stretcher 61
Split ring gas check 13
Sponge cup for money counters 73
Spring return motor carriage 13
Spur 20
Stacking swivel 18
Steam trap 57
Steel ribbing for aparejos 23
Steering gear, power 27
Stencil printing, means for 68

Page.
Stevenson, August, master shipwright ---- 55
Stewart, A. T., employee in the Government Printing Office ---- 74
Stewart, James M., employee office of Quartermaster-General, War Department ---- 24
Sticht, John L., lieutenant-commander, U. S. Navy ---- 39
Stockett, John W., draftsman, Ordnance Office ---- 14
Stokes, Charles F ---- 61
Stopper, boiler-tube ---- 58
Strauss, Joseph, lieutenant-commander, U. S. Navy ---- 32
Stretcher, splint ---- 61
Suction head for hydraulic dredging ---- 27
Suter, Charles R., brigadier-general, U. S. Army, retired ---- 27
Surveying instrument, attachment to ---- 63
Swivel for jackknives ---- 60
Tabulating devices ---- 71
Tanner sounding tubes ---- 46
Taylor, D. W., naval constructor, U. S. Navy ---- 51
Tasker, V. C ---- 31
Telegraph relay ---- 26
Telegraph ship ---- 53
Telephone device ---- 26
Telescope and mount ---- 48
Telescope with illuminating cross wire ---- 37
Telescopic ordnance sight ---- 37
Telescopic sights for guns, etc ---- 36, 37
Telescopic smoke pipe ---- 58
Tent, hospital ---- 23
Tent, improved shelter ---- 22
Tent, Sibley ---- 22
Thomas, B. R., United States engineers office, Cincinnati, Ohio ---- 26
Thomas, B. R. and J. C ---- 27
Three-arm protractor ---- 51
Tide indicating apparatus ---- 28
Tide predicting machine, maxima and minima ---- 69
Timber bending machines ---- 55
Time ball and detaching apparatus ---- 47
Tin boxes, hermetically sealed ---- 24
Titsworth, Richard, blacksmith, Quartermaster's Department, U. S. Army, Fort Bliss, Tex ---- 25
Tobin bronze ---- 59
Tool, countersinking and drilling ---- 55
Topham, Richard B ---- 74
Torpedo appliances ---- 38
Torpedo, automobile ---- 39
Tracy, J. E. W., Bureau of Plant Industry ---- 65
Transmission ropes, apparatus for tightening, to steering engines ---- 53
Triple cam holder, punch and bender ---- 55
Trunnion, ball-bearing ---- 32
Turning gear for electrical turrets ---- 51
Turpin, W. S., lieutenant, U. S. Navy ---- 61
Universal joint ---- 61
Variable speed gear ----
Vegetable peeling machine ---- 21
Very, Edward W., superintendent of construction, Light-House Establishment ---- 46
Warrington, George, employee Light-House Board ---- 70
Water in butter, apparatus for determining ---- 64
Water motors, governors for ---- 39
Weaver, C. Raymond ----
Weir, bear trap ---- 27
Wells, R. W., engine tender ---- 55
Wenke, Franz, blacksmith, Quartermaster's Department, U. S. Army, Fort Reno, Okla ---- 19
Wheeler, E. A., clerk, Subsistence Department, U. S. Army ---- 20
Wheeler, H. T ---- 36
Whistler, G. N., colonel, U. S. Army ---- 13, 17, 19

Page.
White, R. D., lieutenant, U. S. Navy 40, 53
Whitman, Royal E., captain, U. S. Army, retired 20
Whittemore, James M., brigadier-general, U. S. Army, retired 17
Wildman, Leonard D., captain, U. S. Army 25
Wilkinson, Joseph T., counter in Government Printing Office 72
Williams, Charles W., major, U. S. Army, deceased 22
Williams, Harvey D., ordnance engineer, Navy Department 33, 39, 59
Williams, H. S., professor, Geological Survey 62
Willits, A. B., commander, U. S. Navy 58
Wilson, E. M., Miss, General Land Office 64
Wilson, H., Naval Gun Factory 35, 39, 59
Wilson, Theodore D., naval constructor, U. S. Navy 52
Wire gun 12
Wireless device 68
Wireless telegraphy 46, 66
Wooden box to carry tin box 24
Wood, W. M., lieutenant, U. S. Navy 57
Woven cartridge belts 17

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